255

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CONTENTS

3924
DENVER, COLORADO

TRADE NAME	MODEL	SET AND FOLDER NO.
Airline	35GAA-944A, 35GAA-945A, 35GAA-946A	255-2
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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 15 IN SET 229

Ch.1-518-1, -2, -3

Production Changes in Sylvania Ch. 1-518-1, thru code C03, Ch. 1-518-2, thru code C09 and 1-518-3, thru code C10, are covered in Photofact Folder 15 - Set 229. In later production the following chassis additions and production changes were made.

Ch.1-518-5, -6

Chassis 1-518-5 and 1-518-6 are identical to Ch. 1-518-1 (C00) and 1-518-2 (C09), respectively, except a 21ZP4A picture tube is used. Chassis 1-518-5 uses the alternate VHF tuner, shown on page 19 in Photofact Folder 15 - Set 229, and is included in Models 372, 373, 375, 377 and 527 series, Ch. 1-518-6 uses both the alternate VHF and UHF tuners, shown on page 19 in Photofact Folder 15 - Set 229, and is included in Models 372"U", 373"U", 375"U", 377"U" and 527"U" Series.

The following parts are used in Ch. 1-518-5 and 1-518-6 in lieu of the corresponding parts in Ch. 1-518-1 and 1-518-2.

ITEM No.	PART No.	DESCRIPTION
M3	483-0029	Tube, Halolight*
M5	323-0045	Tuner, VHF, Ch.1-518-5
M6	323-0019	Tuner, UHF, Ch. 1-518-6
M7	323-0038	Tuner, VHF, Ch.1-518-6 (Includes 40MC strip)
R1A	157-0029	Control, Brightness
R1B		Control, Volume & Switch
	716-0029	Mask

Ch.1-518-2(C10), 1-518-3 (C11), 1-518-5 (C01), 1-518-6 (C01)

COMPONENT CHANGE

The tone compensation resistor and capacitor combination (R68, C66) were omitted.

TO INCREASE VIDEO OUTPUT

R120 (4.3Ω) was deleted and the arm of the contrast control (R4) was connected directly to ground.

TO INCREASE SENSITIVITY OF VIDEO IF AMPLIFIERS

The 47Ω video IF amplifier cathode resistors (R22, R32 and R38) were changed from 20% to 5% units (part #181-04705).

Ch.1-518-6 (C02)

TO REDUCE SOUND IF REGENERATION

A shield was added on the underside of the chassis beside the ratio detector transformer (L23) and shielded lead is used from the sound take-off coil (L21) to pin 1 of V9.

Ch. 1-518-2(C11)

TO IMPROVE VHF TUNER AGC ACTION

R24 was changed from 1.5Meg to 1Meg.

The VHF tuner was changed to part #323-0035. This tuner is identical to the one originally used (part #323-0031), shown in the alternate tuner schematic on page 19 in Photofact Folder 15 - Set 229, except the 33KΩ, RF Amp. Cathode resistor, which is incorrectly labeled 800MMF was omitted.

SYLVANIA MODELS 175-18 Series (Ch.1-518-1, -3), 175-18"U" Series (Ch.1-518-2), 372 Series (Ch.1-518-1, -3, -5), 372"U" Series (Ch.1-518-2, -6), 373 Series (Ch.1-518-1, -3, -5), 373"U" Series (Ch.1-518-2, -6), 375 Series (Ch.1-518-1, -3, -5), 375"U" Series (Ch. 1-518-2, -6), 376 Series (Ch. 1-518-1, -3), 376"U" Series (Ch. 1-518-2), 377 Series (Ch. 1-518-1, -3, -5), 377"U" Series (Ch. 1-518-2, -6), 527 Series (Ch. 1-518-5), 527"U" Series (Ch. 1-518-6).

PRODUCTION CHANGES
BULLETIN 107

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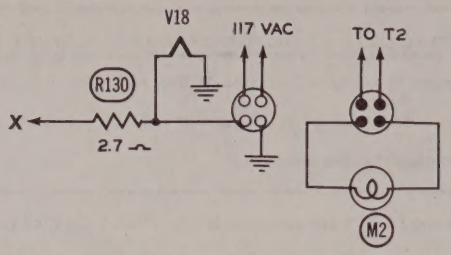
Ch.1-518-2,(C12)

COMPONENT CHANGES

R129, V18 filament dropping resistor was deleted and R130 was changed from 4.7Ω to 2.7Ω and connected as shown below.



Ch. 1-518-5, -6 (C03)

TO IMPROVE THE HORIZONTAL OUTPUT CIRCUIT

The horizontal output circuit was revised as follows:

The horizontal output transformer (T4) was changed to part #241-0019.

The horizontal size coil (T7) was changed to part #132-0005.

R116 was changed from 100Ω to 1000Ω.

R119 was omitted.

C97 was changed from .047MFD to .1MFD .

R122 was changed from 22KΩ to 18KΩ.

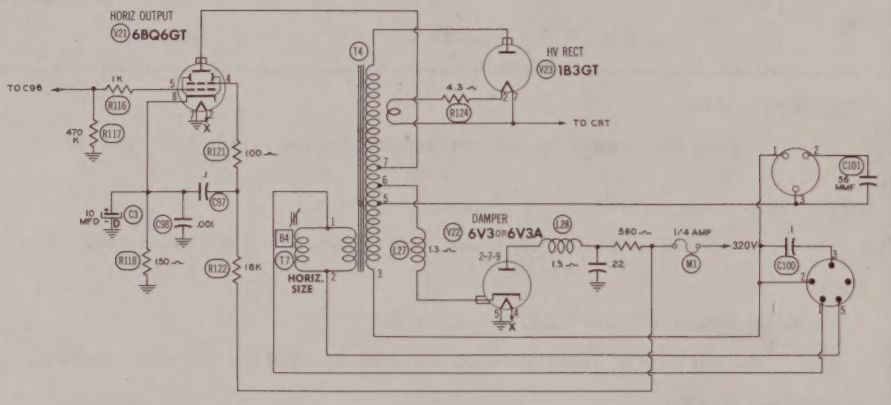
L26 was omitted.

R124 was changed from 2.7Ω to 4.3Ω.

A 560Ω resistor, with a .22MFD bypass capacitor, was added between the junction of M1 and L28.

R123, C4 and C99 was omitted.

A partial schematic showing the revised circuit is given below.



COMPONENT CHANGES

In some chassis the horizontal ringing coil (L25) and R112 were combined in a single unit (part #180-0001). The electrical values of this unit are identical to the original units.

In some chassis the sound IF coupling coil (L22) and R62 were combined in a single unit, (part #180-0002). The electrical values of this unit are identical to the original units.

In some 1-518-5 and 1-518-6 chassis, an alternate brightness-on/off-volume control was used. This part was stamped 37-79047-1. The difference in the controls is that the brightness control resistance was changed to 1Meg. If replacement of this control is made in the field, use control #157-0029.

AIRLINE MODELS 35GAA-944A, 35GAA-945A, 35GAA-946A

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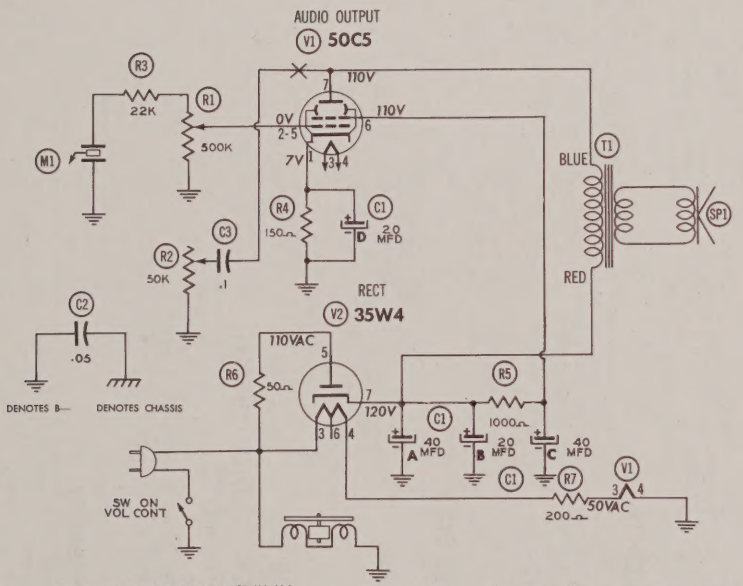
DENVER, COLORADO

AIRLINE MODELS 35GAA-944A, 35GAA-945A, 35GAA-946A

TRADE NAME	Airline Models 35GAA-944A, 35GAA-945A, 35GAA-946A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Phono Amplifier With 3 Speed Manual Record Player
TUBES (Two)	Types 50C5 AF Amp., 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .23 Amp. @ 117 Volts AC



DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	50C5	150Ω	500KΩ	50Ω	0Ω	500KΩ	†1KΩ	†175Ω
V 2	35W4	INF	INF	285Ω	250Ω	325Ω	270Ω	150KΩ

† MEASURED FROM PIN 7 OF V2

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier	50C5	50C5	7CV	
V2	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	1010-A *	PRS150/80-40-20		BBRT8415Q		3N538	TVA-3455	Red
B	20	150								Yellow
C	40	150								Red
D	20	25								Blue
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.1			P488-1	DF-104	CUB4P1		PT401	4TM-P1	Note 1

* Sections C1A and C1B paralleled to give a 60MFD filter.
Note 1. Used in Models 35GAA-946A.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	H9039	Q13-133	A47-500K-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2	50KΩ	½	408					Tone-Note

Note . Used in Model 35GAA-946A only.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R3	22KΩ	½		BTS-22K	
R4	150Ω	½		BTS-150	
R5	1000Ω	½		BTS-1000	Note 1

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R6	50Ω	½			
R7	200Ω	10	623		Note 2

Note 1. Some models may use a 2200Ω resistor in this application.
Note 2. Some models may use a 30Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: AIRLINE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3Ω	Part of speaker	A-3332 ①	A-3025①	S-1X①	Z1101 ①	TS-24S50①	① Bend mounting tabs down, File out slots, mount on original mounting bracket.

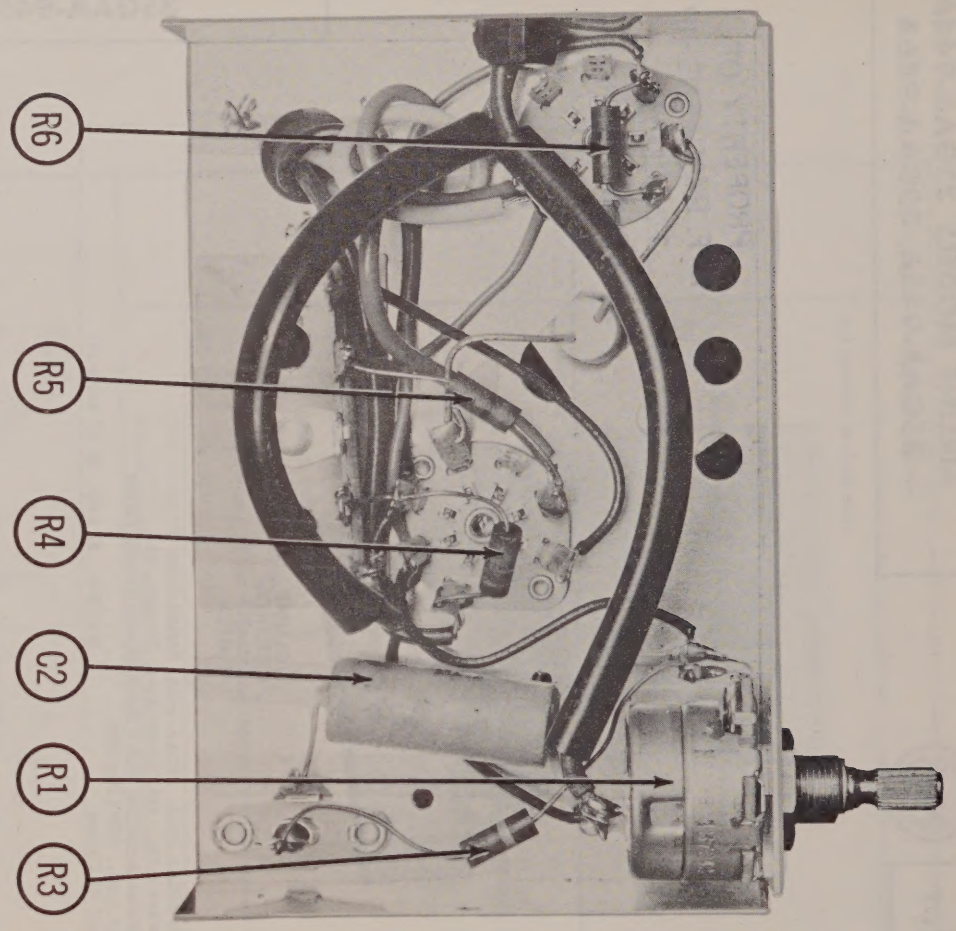
SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: AIRLINE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3Ω	2611	ST-113 Mod. P4-X	4A07	

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1		* PL-29				*24H60		* Complete tone arm and cartridge assembly.

CHASSIS—BOTTOM VIEW



PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	REMARKS
M2		*J-752	*B-379	*W-14AGA	* Metal

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
	Knob	2421	
	Adaptor	1896	45RPM
	Case	2182	Portable #944
	Case	2183	Portable #945
	Case	2184	Portable #946

PHOTOFACT* Folder

*TRADE MARK

CBS COLUMBIA MODELS 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

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The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

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CBS COLUMBIA MODELS 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

MODEL 22M38

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DATE 10–54 SET 255 FOLDER 3

PHOTOFACT* Folder
*TRADE MARK

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CBS COLUMBIA MODELS 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

CBS-COLUMBIA MODEL 22M38 (Ch. 822-10)

TRADE NAME	CBS-Columbia	MODELS	CHASSIS
		18M28, 18M38, 18T28	817-46, -86
		22C38	822-1, -2
		22C48, B, 22C58, 22C68, B	
		22C78, B, 22C88, B, 22M28,	
		22M38, 22T28, B, 22T38, B	822-3, -4, -10

MANUFACTURER	CBS-Columbia, 170 53rd. St., Brooklyn 32, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.84 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 25.75MC, Sound IF 41.25MC (Intercarrier)

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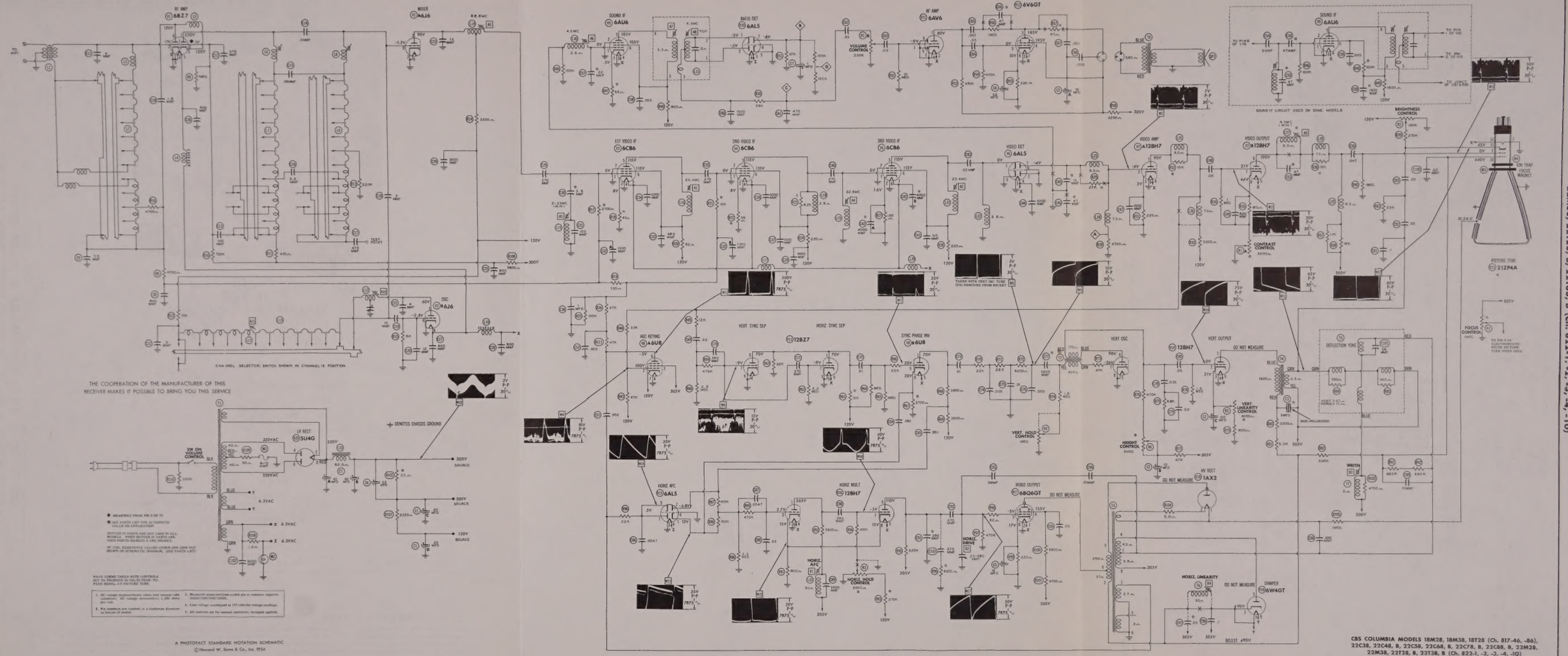

CBS COLUMBIA MODEL 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

CBS COLUMBIA MODELS 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

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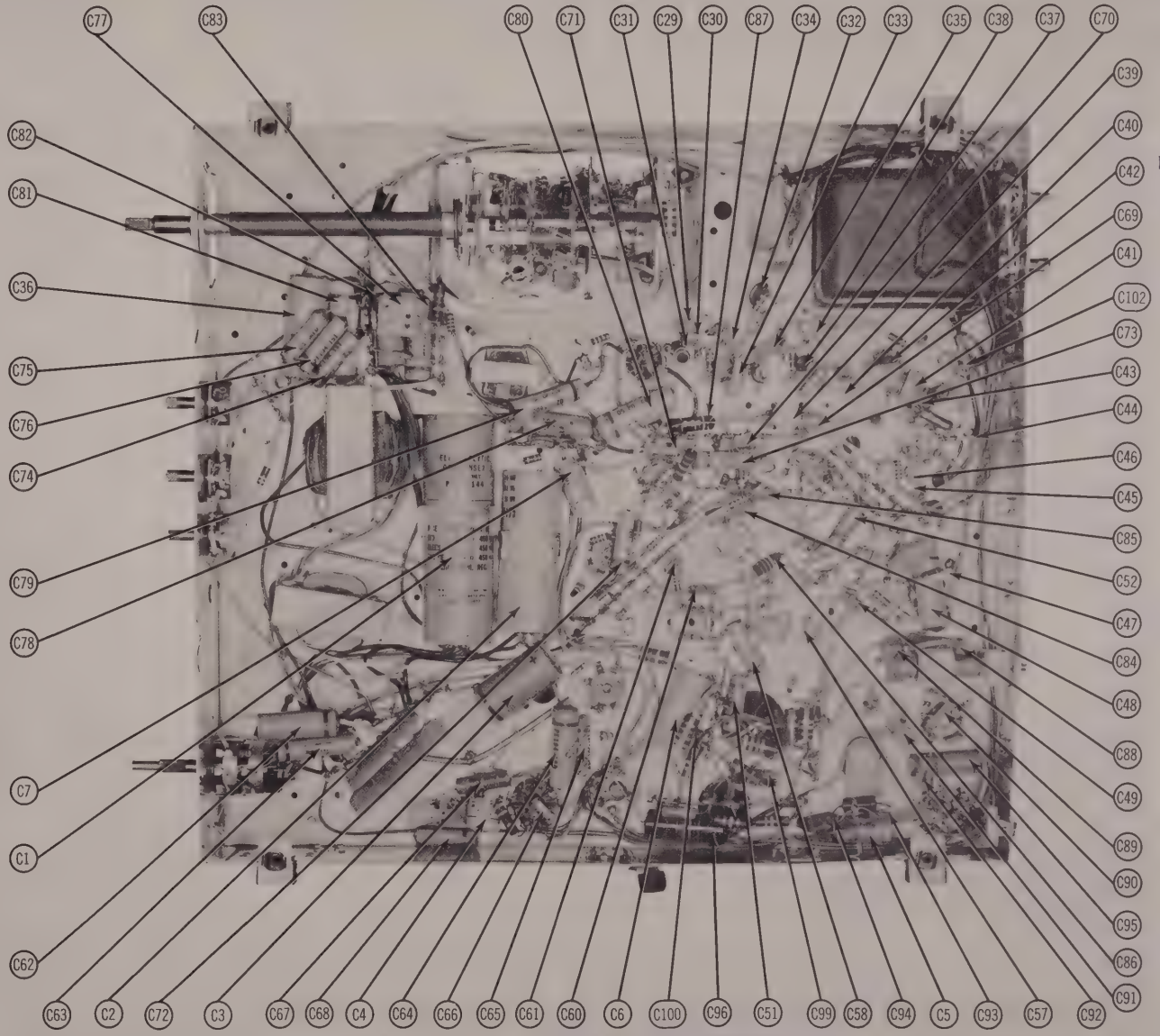
CHASSIS TOP VIEW

CBS COLUMBIA MODELS 18M28, 18M38, 18T28 (Ch. 817-46, -86).
CBS COLUMBIA MODEL 18M28, 18M38, 18T28 (Ch. 817-46, -86),
22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28,
22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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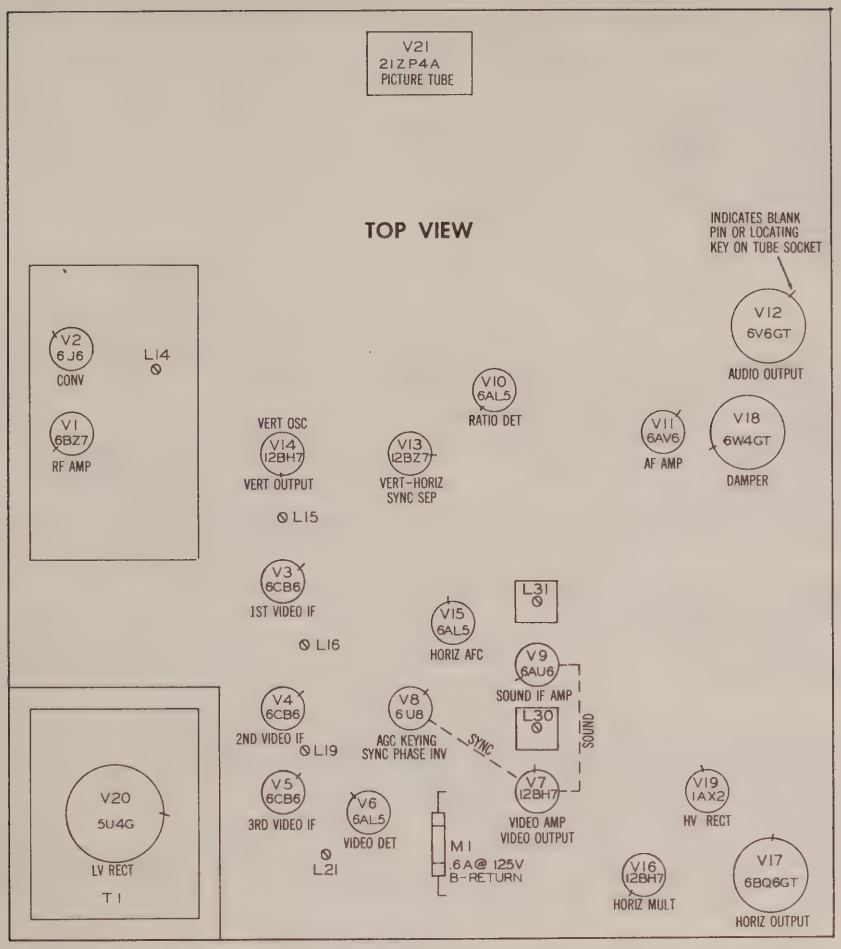
CBS COLUMBIA MODELS 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V20, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V7, V8, V21**
Has pic, no sound - **V9, V10, V11, V12**
Overloaded picture - **V8**

SYNC FAILURE
No vert. sync - **V8, V14**
No horiz. sync - **V8, V15, V16**
No vert. or horiz. sync - **V8, V13**

SWEEP FAILURE
No raster, has sound - **V16, V17, V18, V19, V21**
No vertical deflection - **V14**
Poor vert. linearity or foldover - **V14**
Poor horiz. linearity or foldover - **V16, V17, V18**
Narrow picture - **V16, V17, V18, V19, V20**
Vert. off freq. - **V8, V14**
Horiz. off freq. - **V8, V15, V16**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal output tube (V17) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Attenuate generator output to maintain 3 volts at VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.4MC (Unmod)	Any	DC probe thru 10KΩ to point Ⓐ. Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	"	22.8MC	"	"	A3, A4	"
3.	"	"	21.25MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Attenuate sweep generator output to maintain 5 volts peak to peak vertical deflection on oscilloscope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.25MC 25.75MC	Any	Vert. amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig. 1. If necessary, retouch A1 thru A4 to obtain desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to pin 2 (grid) of 12BH7 (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A6, A7	Adjust for maximum deflection. Attenuate generator output to maintain less than 10 volts at VTVM.
6.	"	"	"	"	DC probe to point Ⓒ Common to point Ⓓ	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to pin 2 (grid) of 12BH7 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A6, A7	Disconnect stabilizing capacitor C7. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
6.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A8	Reconnect stabilizing capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to pin 2 (grid) of picture tube. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A9	Adjust for MINIMUM deflection.

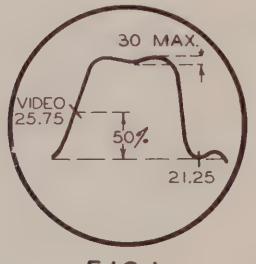


FIG.1

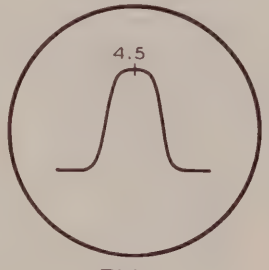


FIG.2

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A10	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
9.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check for marker placement as shown in Fig. 4. Retouch A10 if necessary, to bring any individual high band channel within range of the fine tuning control, then recheck all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
10.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A11	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
11.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check for marker placement as shown in Fig. 4. Retouch A11 if necessary, to bring any individual low band channel within range of the fine tuning control, then recheck all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

VHF RF AND MIXER ALIGNMENT

The VHF RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF OSCILLATOR ALIGNMENT

Connect the high side of the vertical input of oscilloscope to point (A). Connect the low side to chassis. Connect a UHF signal generator to the UHF antenna terminals.
Turn tuning drum fully counter clockwise and adjust signal generator for a signal between 459MC and 466MC (400∿ Mod.). If necessary, compress or spread the short ends of the oscillator tuning capacitor plates until some frequency within the 459 to 466MC range produces a response on scope.
Turn the tuning drum to its maximum clockwise position and adjust the signal generator for a signal between 894MC and 903MC. If a response below 894MC occurs carefully compress the long ends of the oscillator plates to obtain a response between 894 and 903MC. If a response above 903MC occurs spread the long ends of the oscillator plates slightly.

UHF RF AND MIXER ALIGNMENT

Leave generator and scope connected as under "UHF Oscillator Alignment". Adjust signal generator for a 470MC signal and tune in this signal by turning tuning drum nearly maximum counter clockwise.
Compress or spread the short ends of the plates of the RF and mixer tuning capacitor sections for maximum response on scope.
Adjust signal generator for a 890MC signal and tune in this signal.
Compress or spread the long ends of the plates of the RF and Mixer tuning capacitor sections for maximum response on scope.

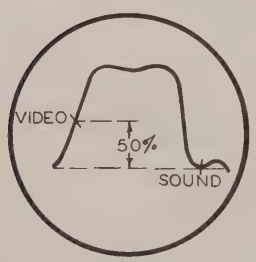


FIG. 4

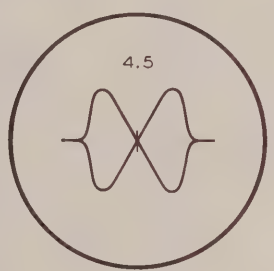
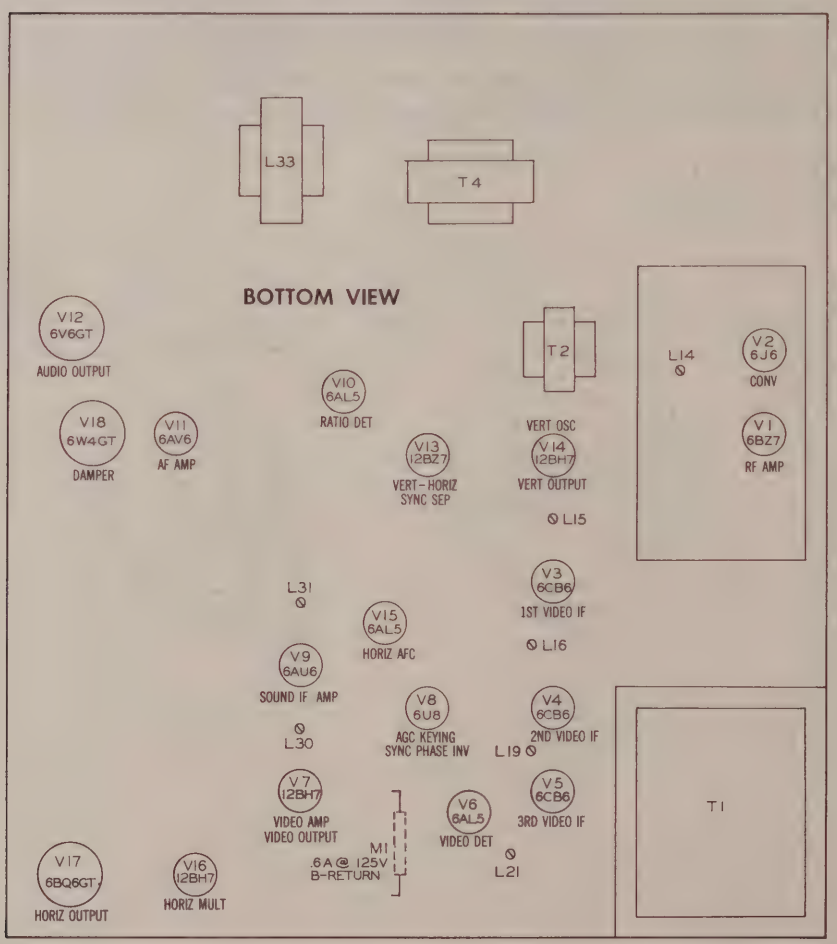


FIG. 3

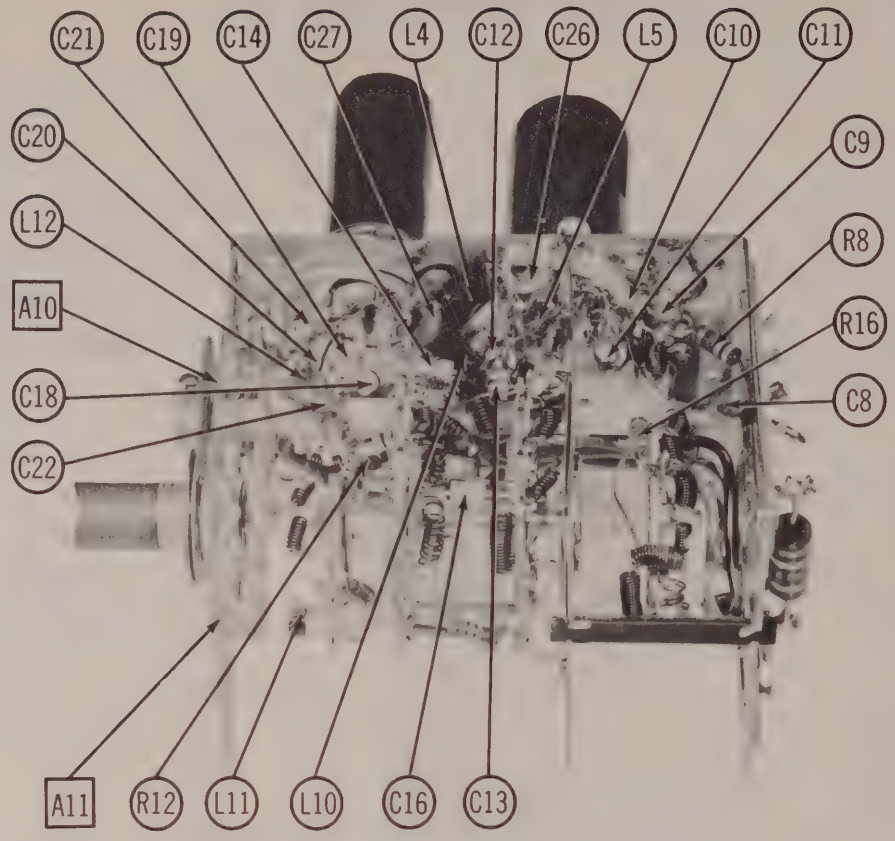
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	† 4. 4KΩ	450KΩ	INF.	0Ω	. 1Ω	INF.	100KΩ	0Ω	0Ω
V 2	6J6	† 12. 4KΩ	† 5. 4KΩ	0Ω	. 1Ω	220KΩ	15KΩ	0Ω		
V 3	6CB6	100KΩ	47Ω	. 1Ω	0Ω	† 2. 4KΩ	† 2. 4KΩ	0Ω		
V 4	6CB6	100KΩ	56Ω	. 1Ω	0Ω	† 2. 4KΩ	† 2. 4KΩ	0Ω		
V 5	6CB6	. 2Ω	150Ω	. 1Ω	0Ω	† 2. 4KΩ	† 2. 4KΩ	0Ω		
V 6	6AL5	2. 8Ω	0Ω	0Ω	. 1Ω	0Ω	0Ω	4. 7KΩ		
V 7	12BH7	† 5. 7KΩ	4. 7KΩ	220Ω	. 1Ω	. 1Ω	† 8KΩ	1. 1Meg	3KΩ	0Ω
V 8	6U8	† 10. 1KΩ	† 25KΩ	† 63Ω	0Ω	. 1Ω	195KΩ	† 2. 3KΩ	2. 7KΩ	600KΩ
V 9	6AU6	100KΩ	0Ω	0Ω	. 1Ω	† 3. 1KΩ	† 3. 1KΩ	68Ω		
V 10	6AL5	INF.	INF.	. 1Ω	9Ω	0Ω	0Ω	47KΩ		
V 11	6AV6	10 Meg	0Ω	. 1Ω	0Ω	0Ω	0Ω	† 470KΩ		
V 12	6V6GT	INF.	0Ω	† 3. 5KΩ	† 3. 3KΩ	470KΩ	† 1 Meg	. 1Ω	330Ω	
V 13	12BZ7	† 15KΩ	2. 2Meg	0Ω	0Ω	0Ω	† 15KΩ	2. 7Meg	0Ω	. 1Ω
V 14	12BH7	▲10KΩ	1. 5Meg	3KΩ	0Ω	0Ω	† 3. 5Meg	3 Meg	0Ω	. 1Ω
V 15	6AL5	3. 4Meg	3. 4Meg	0Ω	. 1Ω	22KΩ	0Ω	22KΩ		
V 16	12BH7	† 5. 7KΩ	3. 8Meg	1. 8KΩ	. 1Ω	. 1Ω	† 220KΩ	120KΩ	1. 8KΩ	0Ω
V 17	6BQ6GT	470KΩ	0Ω	INF.	† 11. 6KΩ	470KΩ	INF.	. 1Ω	220Ω	TOP CAP ▲ 57Ω
V 18	6W4GT	† 65Ω		250KΩ		† 80Ω	INF.	250KΩ	250KΩ	
V 19	1AX2	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲ 347Ω
V 20	5U4G	INF.	20KΩ	INF.	100Ω	INF.	100Ω	INF.	20KΩ	
V 21	21ZP4A	0Ω	1 Meg	PIN 10 ▲ 330KΩ	PIN 11 † 140KΩ	PIN 12 . 1Ω			20KΩ	

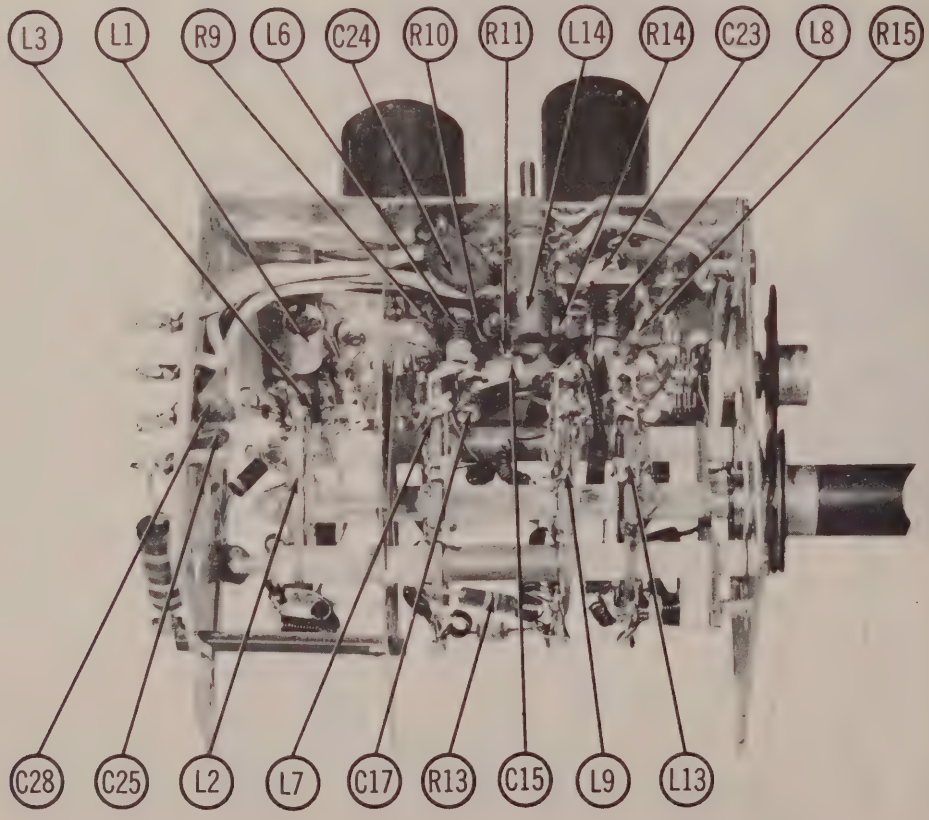
† MEASURED FROM PIN 8 OF V20.
▲ MEASURED FROM PIN 3 OF V18.



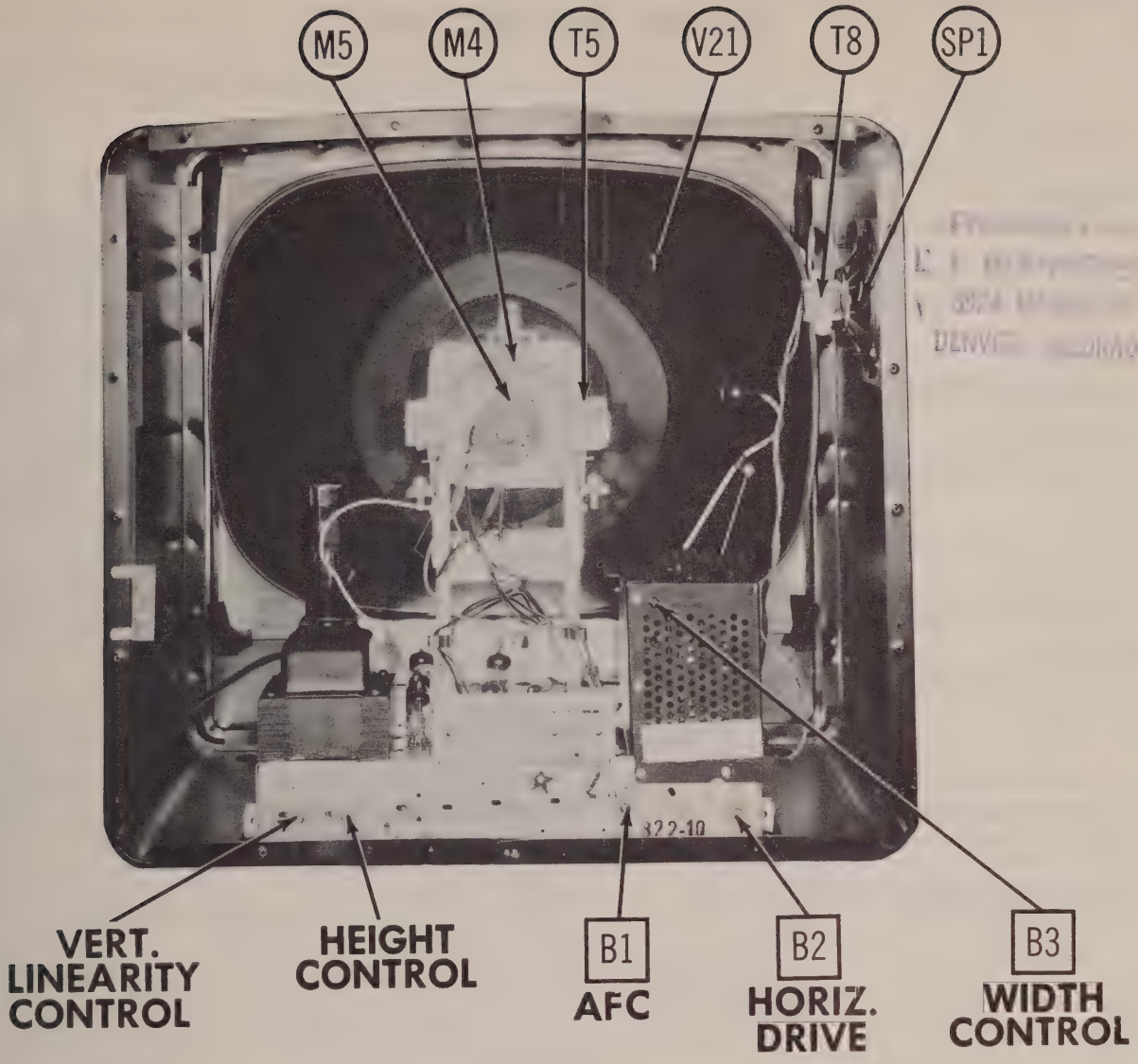
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position and adjust the horizontal AFC slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) in a counter clockwise direction as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check adjustments B2 and B3. Adjust B4 if incorporated in set. Check by substitution V17 and V18. Check R100, R101, C92, C95 and other associated components.

DRIVE LINES

Adjust B2. Check by substitution V17 and V18. Check C92, C5, R97, R100, R101 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V17 and V18. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V16, V17 and V18. Check C88 for open. Check T3, T5A,, L32, C9, R91 and associated components.

XMAS TREE EFFECT

Check by substitution V16, V17 and V18. Check T3 and T5A for internal arcing. Check L32, C89, C90, C92 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V14. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R81, R80 and other associated components.	Check T2, R77, R6, R76, C80 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V14. Check height and vertical linearity control for proper operation. Check T4, T5B, C2B, C2C and other associated components.

COMPRESSED AT BOTTOM

Substitute V14. Check R77, R6, R76, C2B and other associated components.

COMPRESSED AT TOP

Substitute V14. Check C2C, R79, R5, T4 and other associated components.

FOLDS

Substitute V14. Check C78, C79, R75 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check V13 and V8. Check R45, R61, R69, R68, C72, C69, C70 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V14. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T2, C77, R74, R4 and other associated components.	Check vertical integrator network. Check video IF alignment for overloading.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V15 and V16. Check horizontal AFC network for component failure or change of value. Check L32, C89.

HORIZONTAL BENDING

Check by substitution V8, V13, V15 and V16. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C48, C50, R38, R37, L29, R33, L25 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check C48, C50 L28, L25, L23 contrast control, picture tube and other associated components. Check video detector network.

NEGATIVE PICTURE

Substitute V7. Check picture tube, L24, R35, R31, C47, C49 and other associated components. Check AGC network.

SMEAR

Substitute V7. Check L22, L23, L24, L25, L28, R36, C50 and other associated components. Check video IF alignment.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5, V6 and V7 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11 and V12. Check stages V11 and V12 using audio signal generator. Apply audio signal across R1B.

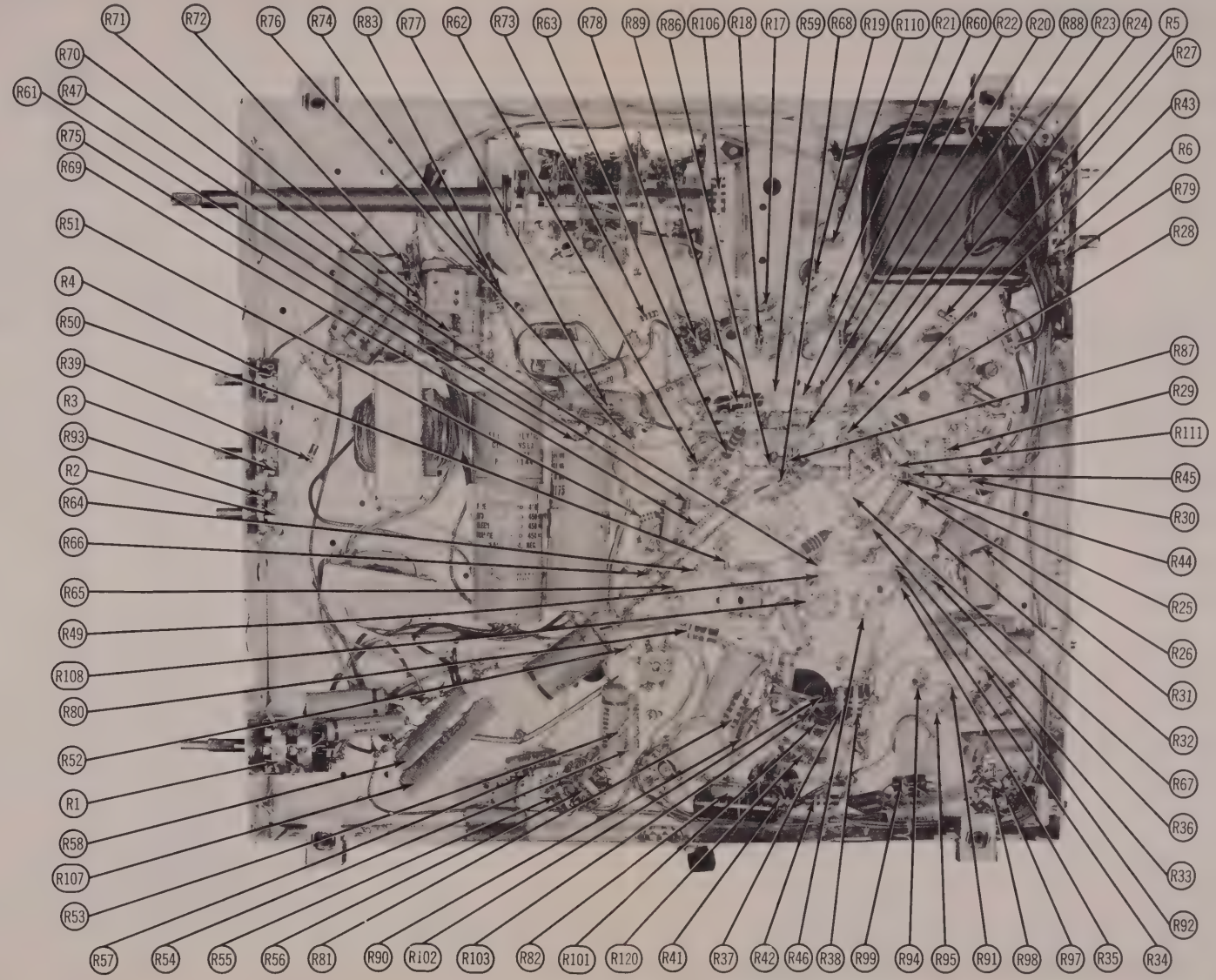
If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C63, C64, C67, C4, R58, R53, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A8 for minimum buzz. If still unsatisfactory, check audio IF alignment.

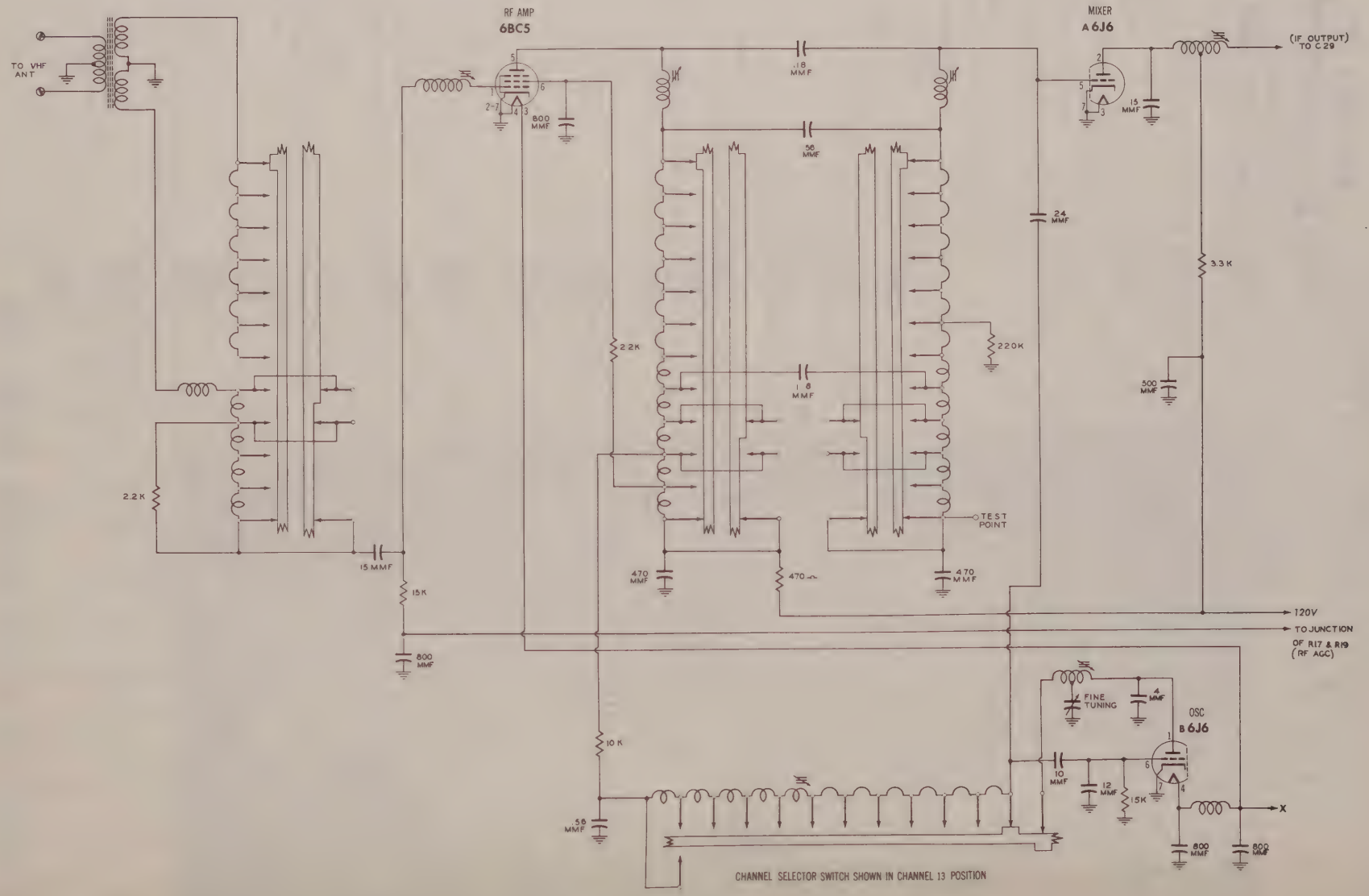
DISTORTED

Follow procedure outlined under "Weak or No Sound".



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



ALTERNATE VHF TUNER PART NO. PC 541339A

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF TUNER SCHEMATIC

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

PROPERTY OF
L. F. DUNKENSHIP
3524 MEADE ST
DENVER, COLORADO

ITEM No.	USE	REPLACEMENT DATA: CBS Columbia PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector	6AL5	6AL5	6BT	
V7	Video Amp. - Video Output	12BH7	12BH7	9A	
V8	AGC Keying-Sync Phase Inv.	6U8	6U8	9AE	
V9	Sound IF Amplifier	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AV6	6AV6	7BT	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Horiz. Sync Sep. - Vert. Sync Sep.	12BZ7	12BZ7	9AJ	
V14	Vert. Oscillator-Vert. Output	12BH7	12BH7	9A	
V15	Horiz. AFC	6AL5	6AL5	6BT	
V16	Horiz. Mult	12BH7	12BH7	9A	
V17	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	1AX2	1AX2	9Y	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: CBS Columbia PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V21	21ZP4A	21ZP4A 21ZP4B ①	21ZP4A	21ZP4A 21ZP4B ① 21ZP4 ②	21ZP4A 21ZP4B ①	12N 12N 12D	① Aluminized ② Circuit changes necessary
	17HP4	17HP4	17HP4	17HP4 17RP4	17HP4	12L 12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CBS Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	450	PA20144	PRS450/40-40		D121		2N537	TVA-2740	Red
B	40	450						TCD75	TVA-2730	Blue
C	20	450		PRS450/20-20						Orange
D	20	450								Green
C2A	10	450	PA20175	PRS450/10-10		C112		TCD72	TVA-2722	Red
B	10	450		PRS50/100				TC3501	TVA-1310	Blue
C	100	50								Yellow
C3	5	350	PA20174					TC62 TC62 *		Note 1
C4	50	25	PA20182	PRS25/50		BR502		TC29	TVA-1206	
C5	10	25	PA20137	PRS25/10		BR102		TC22	TVA-1204	
C6	25	12	PA20147	PRS25/25		BR252		TC26	TVA-1205	
C7	1	100	PA20181	PRS150/4		BR145		TC40	TVA-1402	
C8	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C9	7.5									
C10	1.8									
C11	4									
C12	470									
C13	100			SI100	D6-101		GP1K-101	UC-531	5GA-T1	
C14	.3									
C15	.56									
C16	2.2			SI2.2NP0	TCZ-2.2		NP0K-2R2		5TCCB-V22	
C17	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C18	.3									
C19	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C20	12									
C21	4									
C22	.5									
C23	15			SI15NP0	TCZ-15		NP0K-150	ZT-5415	5TCC-Q15	
C24	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C25	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C26	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C27	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C28	800			BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C29	270	500	PE190-133	1469-0003		22R5T27		MCB241	MS-33	
C30	3.9									Note 2
C31	100	500		1469-0001		22R5T1		MCB235	MS-31	
C32A	1500		PA19147	BPD-2X0015	DD2-152	DK071	822-0015	DCD-5215	5HK-2D15	
B	1500									
C33	680	500	PP556-234	1479-0007		5R5T68			MS-37	
C34	5000		PA19109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C35	270	500	PE190-133	1469-0003		22R5T27		MC241	MS-33	
C36	1.0	100	PE194-A21	484-1		CUB2W1		PT41		
C37	1500		PA19148	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C38	5000		PA19109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C39	5000		PA19109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C40	270	500	PE190-133	1469-0003		22R5T27		MCB241	MS-33	
C41	510	500	PE190-140			5R5T51				
C42	4000			BPD-2X004	DD2-502	DK078	822-004	DCD-524	5HK-2D4	Note 3
C43A	4000									Note 3
B	22	500	PE190-107	1469-000025		22R5Q22		MCB220		
C44	5000		PA19109	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C45	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	Note 4
C46	47		PE555-113-2	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	Note 5
C47	1000		PE555-136	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C48	.05	600	PE194-A160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C49	820		PP19201	SI820	D6-821	K067	GP2K-821		5GA-T82	
C50	.047	600	PE197-160	P688-047	DF-503	CUB6S47		PT615	6TM-S5	
C51	.002	600	PE194-A146	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C52	.002	600	PE194-A146	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C53	47			SI47NP0	TCZ-47	TZ22	NP0K-470	ZT-5447	5TCC-Q47	Note 5

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	CBS Columbia PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	5		PE555-100	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	Note 5
C55	47			SI47NP0	TCZ-47	TZ22	NP0K-470	ZT-5447	5TCC-Q47	Note 5
C56	47		PE555-113-2	SI47NP0	TCZ-47	TZ22	NP0K-470	ZT-5447	5TCC-Q47	Note 5
C57	22			SI22NP0	TCZ-22	TZ14	NP0K-220	ZT-5422	5TCC-Q22	Note 5
C58	.005	600	PE194-A151	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C59	1500		PA19148	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	Note 5
C60	1000		PE556-236	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C61	470		PE556-231	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C62	.05	600	PE194-A160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C63	.02	600	PE194-A156	P688-02	DF-203	CUB682	817-02	PT612	6TM-S2	
C64	.05	600	PE194-A160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C65	.001	600	PE194-A146	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C66	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	Note 5
C67	.001	600	PE194-A146	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C68	.005	600	PE194-A151	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C69	.02	600	PE194-A156	P688-02	DF-203	CUB682	817-02	PT612	6TM-S2	
C70	390	500	PE190-137	1469-0004		5R5T39		MCB243	MS-34	
C71	270	500	PE190-133	1469-0003		22R5T27		MCB241	MS-33	
C72	.01	600	PE194-A155	P688-01	D6-103	CUB681	GP2-333-103	PT611	6TM-S1	
C73	.01	600	PE194-A155	P688-01	D6-103	CUB681	GP2-333-103	PT611	6TM-S1	
C74	.005	500	PE194-A151	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C75	.01	600	PE194-A155	P688-01	D6-103	CUB681	GP2-333-103	PT611	6TM-S1	
C76	.005	600	PE194-A151	P688-006	DF-503	CUB6D6	GP2-333-502	PT625	6TM-D5	
C77	5600	500				1R5D56				Note 6
C78	.035	600	PE194-A159							
C79	.02	600	PE194-A156	P688-02	DF-203	CUB682	817-02	PT612	6TM-S2	
C80	.05	600	PE194-A160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C81	.1	600	PE194-A162	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C82	.05	600	PE194-A160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C83	.05	600	PE194-A160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C84	.001	600	PE194-A145	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C85	.001	600	PE194-A145	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C86	.0047	600	PE197-151	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C87	.0047	600	PE197-151	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C88	.05	600	PE194-A160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C89	3900	500	PE195-261	1464-004		1R5D39		MCE463	MS-34	
C90	390	500	PE190-137	1469-0004		5R5T39		MCB243	MS-34	
C91	390	500	PE190-137	1469-0004		5R5T39		MCB243	MS-34	Note 7
C92	270	500		1469-0003		22R5T27		MCB241	MS-33	
C93	5	2500	PP19145	HVD30-10	DD30-10		5K-6R7	MCP250	30GA-V47	
C94	10	2500	PP19146	HVD30-10	DD30-100	5P25Q5	5KV-100	MCP410	30GA-Q1	
C95	.05	500	PE197-160	P688-05	DF-503	CUB685		PT615	6TM-S5	
C96	.1	600	PE197-162	P688-1		CUB6P1		PT601	6TM-P1	
C97	.05	600	PE197-160	P688-05		CUB685		PT615	6TM-S5	Note 5
C98	500	20000	PA1998-3	HV20C	TV3-502	MMU20T5	413	HV20035A	20DK-T5	
C99	10	2500	PP19146	HVD30-10	DD30-100	5P25Q5	5KV-100	MCP410	30GA-Q1	
C100	22	1500	PE18232	HVD15-22	DD30-221		1K5KV-220	MCM422	20GA-Q22	
C101	56									
C102	5000		PA19199	BPD-005	DD-502	K080	811-005	DC-526	5HK-D5	
C103	120		PE180-125							Note 5

* To replace original unit, connect negative terminals together, and positive terminals to circuit.

Note 1. Non-polarized unit.
Note 2. Some models use 5MMF in this application. (Part #PE555-100).
Note 3. In some models, C43A and C43B is a dual 5000MMF (part #PP19183).
Note 4. Some models use 10MMF in this application (part #PE555-101).
Note 5. Not used in all models.
Note 6. Some models use 4700MMF in this application (part #PE192-163).
Note 7. When C103 is used C91 is 270MMF.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	CBS Columbia PART No	IRC PART No.	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω	2	36000381	* QJ-502	RTV-361		WF53	Contrast-panel-wire wound- Note 1
B	250KΩ	½					UR254A	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	100KΩ	½	PA-24110-D	Q11-128	A47-100K-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	RS-3	AK-1	Not Req.	Attach to R2A
R3A	5000Ω	½	PA-24141-B	Q11-114	A47-5000-S	AB-10	SU-14	Horiz. Hold-Note 5
B	Shaft		Not Req.	Not Req.	RS-3	AK-1	Not Req.	Attach to R3A
R4A	1 Meg	½	PA-24112-C	Q11-137	A47-1Meg-S	AB-69	SU-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	RS-3	AK-1	Not Req.	Attach to R4A
R5A	3000Ω	½	3800231		A47-3000-S	AB-8	SU-8	Vert. Linearity-Note 2
B	Shaft		Not Req.		FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5 Meg	½	36000201	Q11-141	A47-5Meg-S	AB-87	SU-67	Height-Note 3
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7	1 Meg	½	A24112					Focus-Note 4

Note 1. Some models may use an alternate control Part No. A-24142.
Note 2. Some models may use an alternate control Part No. A24114.
Note 3. Some models may use an alternate control Part No. A24111.
Note 4. Used only in chassis 817-48 and 817-86.
Note 5. Not used in chassis 822-1.
† Universal replacement (Mallory exact duplicate Part No. UE-505W6).
* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS W17-1I4 & P3-104 (Panel) B13-130 & RI-130 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	CBS Columbia PART No.	IRC PART No.	NOTES
R8	4700Ω	½		BTS-4700	
R9	1 Meg 5%	½		BTS-1 Meg5%	
R10	750KΩ	½		BTS-750K	
R11	470Ω	½		BTS-470	
R12	10KΩ	½		BTS-10K	
R13	220KΩ	½		BTS-220K	
R14	3300Ω	½		BTS-3300	
R15	15KΩ	½		BTS-15K	
R16	4700Ω	½		BTS-4700	
R17	2700Ω	½	PE231-1159	BTS-2700	Note 1
R18	47Ω	½	PE231-1117	BTS-47	Note 2
R19	330Ω	½	PE231-1137	BTS-330	
R20	82Ω	½	PE231-1123	BTS-82	
R21	10KΩ	½		BTS-10K	Note 3
R22	56Ω	½	PE231-1119	BTS-56	Note 4
R23	8200Ω	½		BTS-8200	Note 5
R24	220Ω	½	PE231-1133	BTS-220	
R25	100KΩ	½	PE231-1197	BTS-100K	
R26	47KΩ	½	PE231-1189	BTS-47K	
R27	150Ω	½		BTS-150	
R28	220Ω	½	PE231-1133	BTS-220	
R29	27KΩ	½		BTS-27K	Note 6
R30	4700Ω	½	PE231-1165	BTS-4700	
R31	220Ω	½	PE231-1133	BTS-220	
R32	10KΩ	½		BTS-10K	Note 7
R33	3300Ω	1	PE232-1161		
R34	1 Meg	½	PE231-1221	BTS-1 Meg	
R35	180Ω	½	PE231-1131	BTS-180	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	CBS Columbia PART No.	IRC PART No.	NOTES
R36	15KΩ	½		BTS-15K	Note 8
R37	1KΩ 5%	2	PE233-74		
R38	18KΩ	2	PE233-1179		
R39	270KΩ	½	PE231-1207	BTS-270K	
R40	1 Meg	½	PE231-1221	BTS-1 Meg	
R41	680KΩ	1	PE232-1217	BTS-680K	
R42	680KΩ	1	PE232-1217	BTA-680K	
R43	47KΩ	½	PE231-1189	BTS-47K	
R44	33KΩ	½	PE231-1185	BTS-33K	
R45	12KΩ	½	PE231-1175	BTS-12K	
R46	100KΩ	½	PE231-1197	BTS-100K	
R47	68Ω	½		BTS-68	Note 8
R48	100KΩ	½	PE231-1197	BTS-100K	Note 8
R49	1800Ω	½	PE231-1155	BTS-1800	
R50	39KΩ	½	PE231-1187	BTS-39K	
R51	47KΩ	½	PE231-1189	BTS-47K	
R52	10 Meg	½	PE231-1245	BTS-10 Meg	
R53	470KΩ	½	PE231-1213	BTS-470K	
R54	470KΩ	½	PE231-1213	BTS-470K	
R55	330Ω	1	PE232-1137	BTA-330	
R56	1 Meg	½	PE231-1221	BTS-1 Meg	Note 9
R57	47Ω	½	PE231-1117	BTS-47	Note 8
R58	3250Ω	7			
R59	470KΩ	½	PE231-1213	BTS-470K	
R60	2.2Meg	½	PE231-1229	BTS-2.2Meg	
R61	15KΩ	½	PE231-1177	BTS-15K	Note 10
R62	2.2Meg	1	PE231-1229	BTS-2.2Meg	
R63	22KΩ	1	PE232-1181	BTA-22K	
R64	1 Meg	½	PE231-1221	BTS-1 Meg	
R65	1 Meg	½	PE231-1221	BTS-1 Meg	
R66	22KΩ	½	PE231-1181	BTS-22K	
R67	2700Ω	½	PE231-1159	BTS-2700	Note 10
R68	3900Ω	½	PE231-1163	BTS-3900	
R69	3900Ω	½	PE231-1163	BTS-3900	
R70	22KΩ	½	PE231-1181	BTS-22K	
R71	22KΩ	½	PE231-1181	BTS-22K	
R72	8200Ω	½	PE231-1171	BTS-8200	
R73	47KΩ	½	PE231-1189	BTS-47K	Note 6
R74	1.8Meg 5%	1	PE232-127	BTA-1.8Meg 5%	Note 6 Note 11

ITEM No.	RATING OHMS	RATING WATT	CBS Columbia PART No.	IRC PART No.	NOTES
R75	6800Ω	½	PE231-1169	BTS-6800	
R76	470KΩ	½	PE231-1213	BTS-470K	
R77	47KΩ	½	PE231-1189	BTS-47K	
R78	1.5Meg	½	PE231-1225	BTS-1.5Meg	
R79	1800Ω	½	PE231-1155	BTS-1800	
R80	3300Ω	2	PE233-1161	BTB-3300	
R81	3300Ω	2	PE233-1161	BTB-3300	
R82	330KΩ	1	PE232-1209	BTA-330K	
R83	33KΩ	½	PE231-1185	BTS-33K	
R84	560Ω	½		BTS-560	
R85	560Ω	½		BTS-560	
R86	100KΩ	½	PE231-1197	BTS-100K	
R87	100KΩ	½	PE231-1197	BTS-100K	
R88	3.3Meg	½	PE231-1233	BTS-3.3Meg	
R89	470KΩ	½	PE231-1213	BTS-470K	
R90	22KΩ	1	PE232-1181	BTA-22K	
R91	1800Ω	½	PE231-1155	BTS-1800	
R92	5600Ω	½	PE231-1167	BTS-5600	
R93	270KΩ	½	PE231-1207	BTS-270K	Note 6
R94	100KΩ	½	PE231-1197	BTS-100K	
R95	220KΩ	½	PE231-1205	BTS-220K	
R96	8200Ω	½	PE231-1171	BTS-8200	Note 6
R97	470KΩ	½	PE231-1213	BTS-470K	
R98	82Ω	½	PE231-1123	BTS-82	
R99	220Ω	2	PE233-1133	BTB-220	
R100	6800Ω	2	PE233-1169	BTB-6800	
R101	4700Ω	2	PE233-1165	BTB-4700	
R102	22Ω	½	PE231-1109	BTS-22	Note 12
R103	4700Ω	2	PE233-1165	BTB-4700	
R104	0.5Ω	1	PE23183		
R105	1 Meg	2	PE233-2321	BTB-1 Meg	
R106	3900Ω	2	PE233-1163	BTB-3900	
R107	2250Ω	15	PC2134-16		
R108	1.2Ω	1	PE23151		
R109	80Ω	10	PC2134-2		
R110	220KΩ	1	PE232-1205	BTA-220K	
R111	47KΩ	½	PE231-1189	BTS-47K	
R112	6800Ω	2		BTB-6800	Note 6
R113	6800Ω	2		BTB-6800	Note 6
R114	3900Ω	2	PE233-1169	BTB-3900	Note 11

Note 1. Some models may use a 3900Ω resistor in this application.
Note 2. Some models may use a 33Ω resistor in this application.
Note 3. Some models may use a 18KΩ resistor in this application.
Note 4. Some models may use a 47Ω resistor in this application.
Note 5. Some models may use a 56KΩ resistor in this application.
Note 6. Not used in all models.
Note 7. Some models may use a 4700Ω resistor in this application.
Note 8. Some models may use a 10KΩ resistor in this application.
Note 9. Some models may use a 560KΩ resistor in this application.
Note 10. Some models may use a 8200Ω resistor in this application.
Note 11. Used only when UHF tuner part #PC-541452 is used.
Note 12. Some models use 47Ω in this application.

TRANSFORMER (POWER)

ITEM No	RATING PRI	RATING SEC. 1	RATING SEC. 2	CBS Columbia PART No	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Halldorson PART No.	Thordarson PART No.
T1	117VAC @1.84A	680VCT @.240ADC	5VAC @ 3A	PC-10109	P-8171	P-3069	R-49BS			26R20
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @1.2A	6.3VAC @8.1A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	CBS Columbia PART No.	Stancor PART No	Merit PART No	Triad PART No	RCA TYPE No	Halldorson PART No	Thordarson PART No.
T2	Vert. Osc. Trans.	A-10106-1	A-8125	A-3003	A-97X	209T1 ①	B6702	24A87 ①
T3	Horiz.Output Trans.	PC-10137-C PC-10136 ②	A-8231 *	HV0-10 *	D-33*		FB410 *	FLY-5 *
T4	Vert.Output Trans.	A-10152-1	A-8141 ③	A-3039 ③	A-104X ③	236T1 ③	Z1806 ③	26S54 ③
T5A	Yoke-Horiz. (8.5MH)	A-28330	DY-8A	MDF-70	Y-12-1	206D1 ④	DF601	Y-5
B	Vert. (42MH)	A-28328 ④						
T6	Horiz.-Linearity(3.6-23MH)	A-28297 ⑤	WC-5⑦ ⑧	MWC-1⑦ ⑧	WC-1⑦ ⑧	215R1	RF800⑦ ⑧	WC-14
T7	Width (.2-1.7MH)	A-28296-1	WC-7	MWC-2 ⑦	WC-12 ⑦	206R1		
		A-28279-1 ⑩						

① Drill one new mounting hole.
② Alternate horisontal output transformer.
③ Connect blue lead of transformer to plate, connect green lead of transformer to brown lead of yoke. Remove green lead of yoke from its present terminal and connect it and red lead of transformer to boosted B+.
④ Alternate yoke.
⑤ Use original yoke network.
⑥ Not used in all chassis.
⑦ Enlarge mounting hole.
⑧ Connect to coded blue and red terminals.
⑨ Connect to coded #1 and #2 terminals.
⑩ Alternate width coil.
⑪ Connect to coded green and red terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
3	3	3	3		Hi-volt Rect Plate Lead	3
9	9	2	2		9	2
2	2	1	1		4	1
4	4	4	4		8	5
7	7	5	5		6	8
8	8	6	6		7	6
1	1	7	7		1	7
5 (NC)	5 (NC)	NC	NC		NC	NC
6	6	9	9		11	9

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	CBS Columbia PART No	Stancor PART No.	Merit PART No.	Triad PART No	Halldorson PART No	Thordarson PART No	NOTES
T8	4.95KΩ	3.2Ω	Part of Spkr.	A-3877 ①	A-3026	S-3X ①	Z1000 ①	24S51 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C IMP.	CBS Columbia PART No	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.2Ω	PC-5866	ST-105 Mod. P5-X	5A1	① Used in Models 22C48, 22C48B, 22C58, 22C68 and 22C68B
	6"	PM	3.2Ω	PC-5834 ①	ST-106 Mod. P6-X	6A1	② Used in Models 22C78 and 22C78B
	8"	PM	3.2Ω	PC-5824 ②	ST-115 Mod. P8-Y	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	CBS Columbia PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	0Ω	0Ω					
L2	Ant. Coils	0Ω						
L3	Ant. Coil	0Ω						Channel 13 position
L4	Fil. Choke	0Ω						
L5	Neut. Coil	0Ω						
L6	RF Coil	0Ω						Channel 13 position
L7	RF Coils	0Ω						
L8	Mixer grid coil	0Ω						Channel 13 position
L9	Mixer grid coils	0Ω						
L10	Fil. Choke	0Ω						
L11	Osc. Coil	0Ω						Channel 6 position
L12	Osc. Coil	0Ω						Channel 13 position
L13	Osc. Coils	0Ω						
L14	1st Video IF	.5Ω						
L15	2i. 2.5MC Trap	0Ω		A28314	20-1021 *■	TV-150*■	6193*■	
L16	2nd Video IF	.2Ω		A3392	17-1003	TV-103 ■	6188 ■	
L17	Fil. Choke	.27Ω		A28276	19-3001	TV-189	6175	. 82 Microhenries; IRC Part No. CL-1
L18	RF Choke	2.8Ω		A28253	19-3036	TV-180	6178	35 Microhenries
L19	3rd Video IF	.2Ω		A3392	17-1004	TV-103 ■	6189 ■	
L20	Fil. Choke	.27Ω		A28276	19-3001	TV-189	6175	. 82 Microhenry
L21	4th Video IF	.2Ω		A3392	17-1003	TV-103 ■	6188 ■	
L22	RF Choke	2.8Ω		A28253	19-3036	TV-180	6178	35 Microhenries
L23	Series Peaking coil	6.5Ω		A28255-2	19-3180	TV-184	6154	194 Microhenries
L24	Shunt Peaking Coil	7.5Ω		A28255-1	19-3125	TV-181	6153	130 Microhenries
L25	Series Peaking Coil	6.5Ω		A28255-2	19-3180	TV-184	6154	194 Microhenries
L26	Shunt Peaking Coil	7.5Ω		A28255-1	19-3125	TV-181	6153	130 Microhenries
L27	4.5MC Trap	2.8Ω		A28266	20-1004	TV-151	1469	Used in models 18T28, 18M28, 18M38, 22C38, 22C58, 22C88, 22C88B, 22C48, 22C48B, 22C78, 22C78B
L28	Series Peaking Coil	7.5Ω		A28255-1	19-3125	TV-181	6153	130 Microhenries
L29	Shunt Peaking Coil	9.5Ω		A28255-4	19-3300		6155	314 Microhenries
L30	Sound IF	2.6Ω		A28286	20-1004	TV-151	1469	
L31	Ratio Det.	5.5Ω	.2QCT	A1201	17-3497	TV-115	6205	. 5Ω tertiary winding
L32	Horiz. Osc.	60Ω		A28263	19-1576	TV-163	6210	

* Use trap winding only.
■ Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~\	CBS Columbia PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L33	.240ADC	62.5Ω	1.74 Hy.	PB-1406	C-2325 ①	C-2961 ①	C-23X ①	C5037 ①	26C44 ①

① Drill one new mounting hole.

CBS COLUMBIA MODEL 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			CBS Columbia PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T Slo/Blo	6/10A 125V	A4955		315.600 (6/10A-3AG-S/B P/T		MDV 6/10	

MISCELLANEOUS

ITEM No.	PART NAME	CBS Columbia PART No.	NOTES
M2	Dial light		# 47 bayonet-chassis 817-86, 822-2, 822-4
M3	Tuner	A541339	VHF (17" chassis) pentode
	Tuner	A541339	VHF (21" chassis-rear control sets) pentode
	Tuner	A541229	VHF (21" chassis-front control sets) cascode
	Tuner	A541336	VHF-cascode
	Tuner	A541335	UHF
	Tuner	A541452	UHF
M4	Focus magnet	19000091	Includes centering device-chassis 822-1, -2, -3, -4, -10
M5	Ion trap		
B2	Trimmer cap.	PA1772	Horiz. Drive (25-280MMF)
	Cabinet	A60205-1	Model 18T28-VHF & UHF Models
	Cabinet	A60181-1	Model 18M28-VHF & UHF Models
	Cabinet	A60181-3	Model 18M38-VHF & UHF Models
	Cabinet	A60178-1	Model 22M28-VHF & UHF Models
	Cabinet	A60178-3	Model 22M38-VHF & UHF Models
	Cabinet	A60198-1	Model 22T28- VHF & UHF Models
	Cabinet	A60198-2	Model 22T28B- VHF & UHF Models
	Cabinet	A60201	Model 22C38 - VHF & UHF Models
	Cabinet	A60200-1	Model 22C48- VHF & UHF Models
	Cabinet	A60200-2	Model 22C48B- VHF & UHF Models
	Cabinet	A60184-1	Model 22C58- VHF & UHF Models
	Cabinet	A60196-1	Model 22C68- VHF & UHF Models
	Cabinet	A60196-2	Model 22C68B - VHF & UHF Models
	Cabinet	A60164-1	Model 22C78- VHF & UHF Models
	Cabinet	A60164-2	Model 22C78B- VHF & UHF Models
	Cabinet	PE60234-1	Model 22T38- VHF & UHF Models
	Cabinet	PE60234-2	Model 22T38B- VHF & UHF Models
	Cabinet	70001371	Model 22C88- VHF & UHF Models
	Cabinet	70001372	Model 22C88B - VHF & UHF Models
	Knob	A39281-1	Channel selector- Model 18T28, 18M38,22M38, 22T28, 22C38, 22C48, 22C58, 22C68, 22C78, (VHF Models)
	Knob	A39281-2	Channel selector-Models 18M28, 22M28, 22T28B, 22C48B, 22C68B, 22C78B, (VHF Models)
	Knob	A39277-1	Channel selector-Models 18T28, 18M28, 22M28, 22T28, 22C38, 22C48, 22C58, 22C68, 22C78, (UHF models)
	Knob	A39277-2	Channel selector-Models 18M38, 22M38, 22T28B, 22C48B, 22C68B, 22C78B (UHF models)
	Knob	PB39277-1	Channel selector-Models 22T38, 22C88, (UHF models)
	Knob	PB39279-1	Channel selector-Model 22T38B (UHF model)
	Knob	PB39277-2	Channel selector-Model 22C88B (UHF model)
	Knob	PC39281-1	Channel selector-Models 22T38, 22C88, (VHF models)
	Knob	PC39281-2	Channel selector-Models 22T38B, 22C88B, (VHF models)
	Knob	A39280-1	On-off volume Models 18T28, 18M38, 22M38, 22T28, 22C38, 22C48, 22C58, 22C68, 22C78, (VHF Models)
	Knob	A39280-1	On-off -volume Models 18T28, 18M28, 22M28, 22T28, 22C38, 22C48, 22C58, 22C68, 22C78, (UHF models)
	Knob	A39280-2	On-off-volume Models 18M28, 22M28, 22T28B, 22C48B, 22C68B, 22C78B (VHF models)
	Knob	A39280-2	On-off-volume Models 18M38, 22M38, 22T28B, 22C48B, 22C68B, 22C78B (UHF models)
	Knob	PC39280-1	On-off-volume Models 22T38, 22C88, (VHF & UHF)
	Knob	PC39281-2	On-off-volume Models 22T38B, 22C88B, (VHF & UHF)
	Knob	A39279	Contrast-Models 18T28, 18T28, 18M28, 18M38, 22M28, 22M38, 22T28, 22T28B, 22C38, 22C48, 22C48B, 22C58, 22C68, 22C68B, 22C78, 22C78B, 22T38, 22T38B, 22C88, 22C88B (VHF & UHF Models)
	Knob	A39278	Vernier-Models 18T28, 18M28, 18M38, 22M28, 22M38, 22T28, 22T28B, 22C38, 22C48, 22C48B, 22C58, 22C68, 22C68B, 22C78, 22C78B, 22T38, 22T38B, 22C88, 22C88B (VHF & UHF Models)
	Safety glass	A44111-2	Models-18T28, 18M28, 18M38, 22M28, 22M38, 22T28, 22T28B, 22C48, 22C48B, 22C58, 22C68, 22C68B, 22C78, 22C78B (VHF & UHF Models)
	Safety glass	PC62457-13	Models-22T38, 22T38B (VHF & UHF models)
	Safety glass	PC62457-25	Models-22C88, 22C88B (VHF & UHF models)
	Mask	A62473	Model 18T28 VHF & UHF Models
	Mask	A62470	Models 18M28, 18M38 VHF & UHF Models
	Mask	A62455	Models 22M28, 22M38, VHF & UHF Models
	Mask	A62651	Model 22T28 (UHF Model) & Models 22T28B, 22C38, 22C58 (VHF & UHF Models)
	Mask	A62484	Models 22T28 (VHF Models) & Models 22C78, 22C78B (VHF & UHF Models)
	Mask	A62652	Models 22C48, 22C48B, 22C68, 22C68B (VHF & UHF Models)
	Mask	PC62484	Models 22T38, 22T38B (VHF & UHF Models)
	Mask	PC62481-13	Models 22C88, 22C88B (VHF & UHF Models)
	Indicator Disc (UHF)	A40152	Models 18T28, 18M28, 18M38, 22M28, 22M38, 22T28, 22T28B, 22C38, 22C48, 22C48B, 22C58, 22C68, 22C68B, 22C78, 22C78B, 22T38, 22T38B, 22C88, 22C88B (UHF Models)

PROPERTY OF
L. F. RIANTENSHIP
3011 MEADE ST.
DENVER, COLORADO

CBS COLUMBIA MODEL 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

ALTERNATE VHF TUNER SCHEMATIC

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, substitute V20. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Substitute V20. Check B+ filter and decoupling network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V16, V17, V18 and V19. Check waveform W17. Check M1 fuse.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C96, C97, C95, R101, R100 and other associated components.	Check C90, C92, C89, L32, R92, R95, R91 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V17, V18 and V20. Check R100, R101, T3, T5A and other associated components.

BLOOMING

Check by substitution V17, V18, V19 and V20. Check B+ filter and decoupling network. Check T3, T5A and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6, V7 and V8. Check video IF components.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

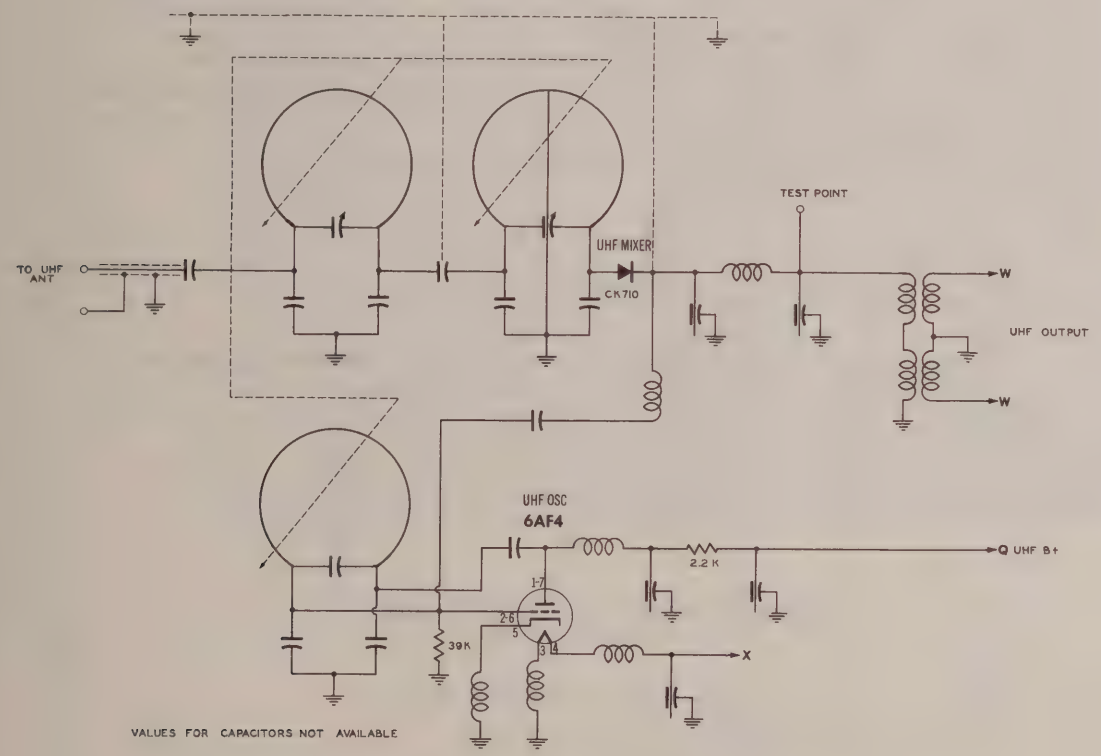
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



UHF TUNER PART NO. PC 51452 USED WITH
VHF TUNER PART NO. PC 541336

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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UHF SCHEMATIC

CBS COLUMBIA MODELS 18M28, 18M38, 18T28 (Ch. 817-46, -86), 22C38, 22C48, B, 22C58, 22C68, B, 22C78, B, 22C88, B, 22M28, 22M38, 22T28, B, 22T38, B (Ch. 822-1, -2, -3, -4, -10)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removing the Channel Selector and Fine Tuning knobs.

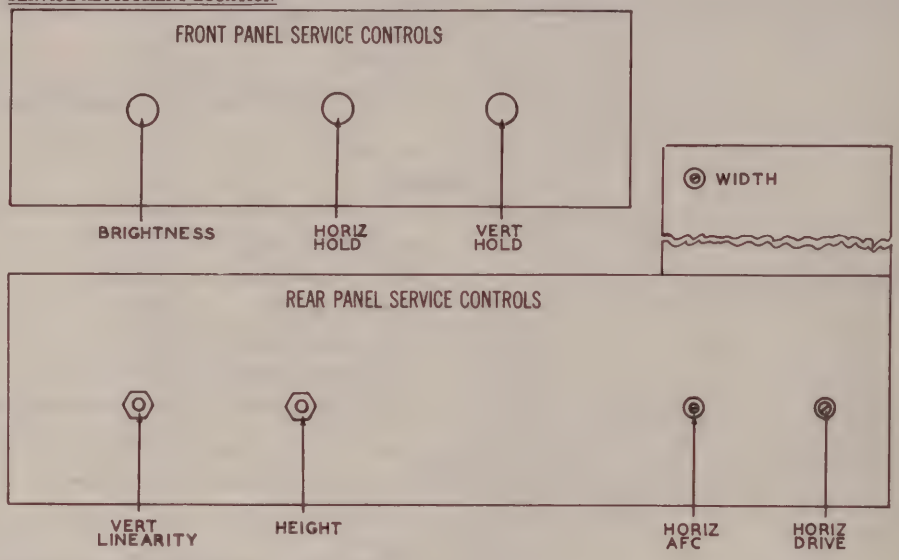
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 metal screws from lower safety glass molding. Remove molding and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

Remove safety glass and mask. Remove 1 bolt from front picture tube mount. Remove rear cover, and disconnect tube socket, Ion trap, and H. V. lead. Remove picture tube.

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. AFC slug L32 until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the Ratio Detector Secondary L31 located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for L. V. Power Supply protection. (For location see Tube Placement Chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

Remove 4 push-on type control knobs from front panel.

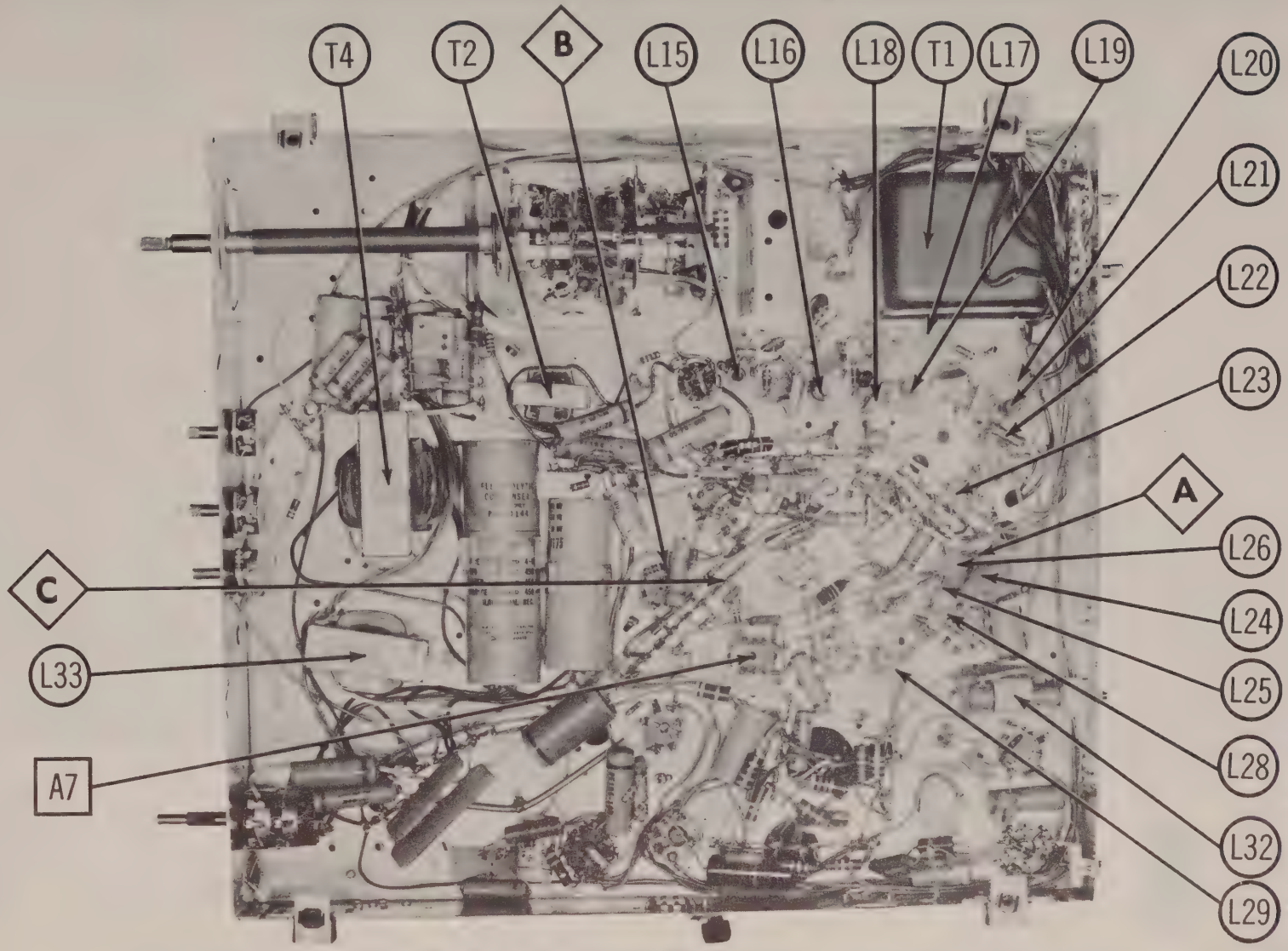
Remove 17 metal screws. Remove cover.

Disconnect speaker leads.

Remove 2 speaker nuts. Remove speaker.

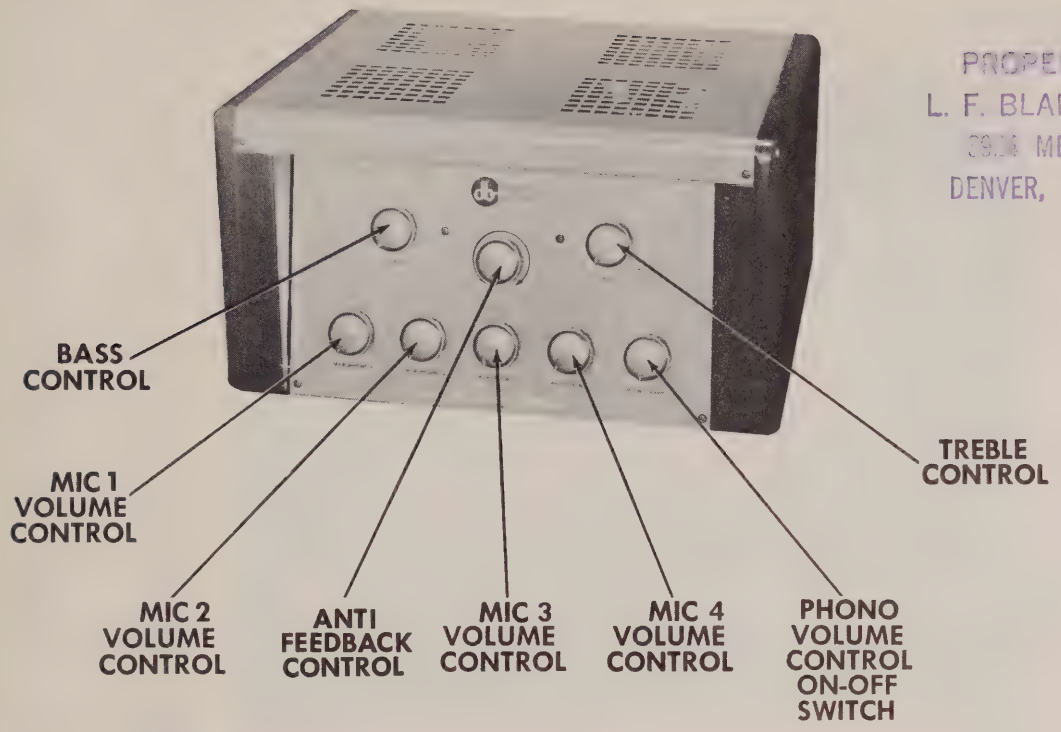
Remove 2 metal screws. Remove antenna bracket.

Remove 6 chassis bolts. Remove chassis.



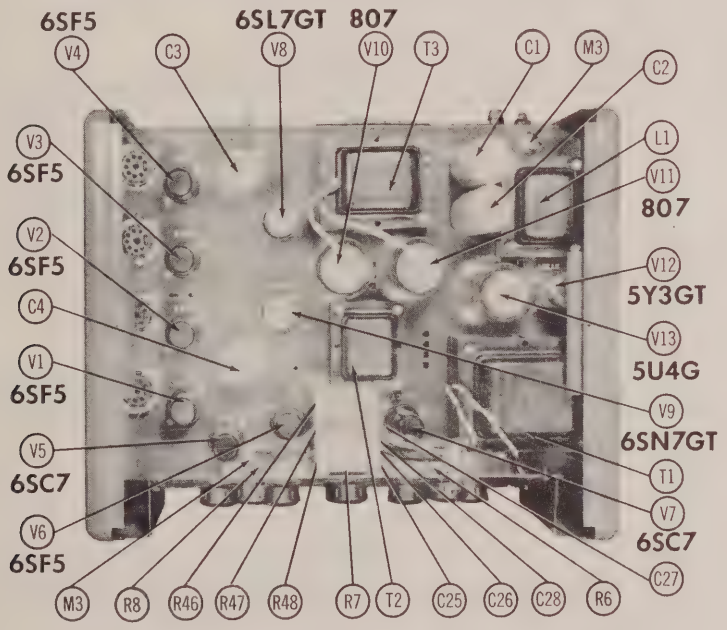
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
[illegible] MEADE ST.
DENVER, COLORADO



DAVID BOGEN
MODEL JX50

TRADE NAME	David Bogen Model JX50
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York 14, N.Y.
TYPE SET	AC Operated 5 Channel 50 Watt Audio Amplifier
TUBES	Thirteen
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.55 Amp. @ 117 Volts AC



CHASSIS—TOP VIEW

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	Mic-Pre Amplifier	6SF5	6SF5	6AB	
V2	Mic-Pre Amplifier	6SF5	6SF5	6AB	
V3	Mic-Pre Amplifier	6SF5	6SF5	6AB	
V4	Mic-Pre Amplifier	6SF5	6SF5	6AB	
V5	Mixer & Pre. Amp.	6SC7	6SC7	8S	
V6	AF Amplifier	6SF5	6SF5	6AB	
V7	AF Amplifier	6SC7	6SC7	8S	
V8	Phase Inverter	6SL7GT	6SL7GT	8BD	
V9	Driver	6SN7GT	6SN7GT	8BD	
V10	Audio Output	807	807	5AW	
V11	Audio Output	807	807	5AW	
V12	LV Rectifier	5Y3GT	5Y3GT	5T	
V13A	HV Rectifier	5U4G	5U4G	5T	
B	HV Rectifier	5R4GY	5R4GY	5T	

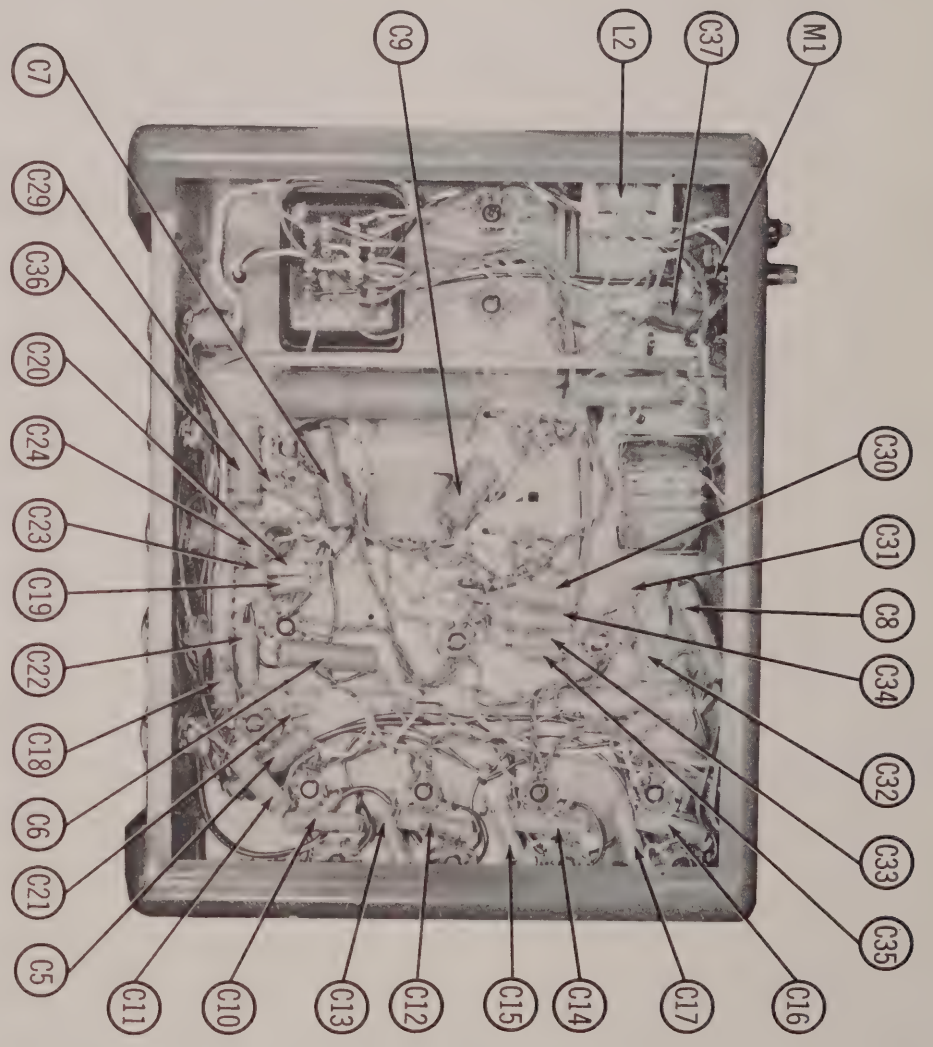
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	8	500				EB10023				Red
B	8	500								Blue
C2	4	600		GL600/4		KR604C		HS691	AP46	
C3A	▲5	450		AFH4-09		D008		WP433.6	R1424	
B	■5	450								
C	▲5	450								
D	5	450								
C4A	▲5	450		AFH4-09		D008		WP433.6	R1424	
B	■5	450								
C	▲5	450								
D	5	450								
C5	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C6	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C7	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C8	100	25		PRS25/100		BRH251		TC2501	TVA-1207	
C9	50	50		PRS50/50		BR505		TC39	TVA-1308	
C10	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C11	.03	600		P688-03		CUB6S3		PT613	6TM-S3	
C12	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C13	.03	600		P688-03		CUB6S3		PT613	6TM-S3	
C14	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C15	.03	600		P688-03		CUB6S3		PT613	6TM-S3	
C16	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C17	.03	600		P688-03		CUB6S3		PT613	6TM-S3	
C18	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C19	2000	500		1464-002		1R5D2		MC457	MS-22	Note 1
C20	3300	500		1464-003		1R5D33		MC461	MS-23	
C21	470	500		1469-0005		5R5T47		MC245	MS-35	
C22	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C23	150	500		1469-00015		22R5T15		MC236	MS-32	
C24	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C25	2000	500		1464-002		1R5D2		MC457	MS-22	
C26	2000	500		1464-002		1R5D2		MC457	MS-22	
C27	200	500		1469-0002		22R5T2		MC237	MS-32	Note 3
C28	3800	500		1464-004		1R5D39		MC463	1FM-24	Note 3
C29	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C30	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C31	.003	600		P688-003	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C32	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C33	.02	600		P688-02	DF-203	CUB6S2		PT612	6TM-S2	
C34	.02	600		P688-02	DF-203	CUB6S2		PT612	6TM-S2	
C35	100	500								
C36	.25	400		P488-25		CUB4P25		PT4025	4TM-P25	
C37	.047	600		689ZX-047	DF-503	PJ6S47		PT6147	6TM-S47	Note 2

Note 1. Some models may use a 2200MMF @ 500V in this application.
Note 2. Some models may use a .01MMF @ 600V in this application.
Note 3. Not used in all models.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V202C	Q13-133	A47-500K-Z	B-60	U-48	Micro phone No. 1
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	V202C	Q13-133	A47-500K-Z	B-60	U-48	Microphone No. 2
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	V202C	Q13-133	A47-500K-Z	B-60	U-48	Microphone No. 3
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	500KΩ	½	V202C	Q13-133	A47-500K-Z	B-60	U-48	Microphone No. 4
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R4A
R5A	500KΩ	½	V149B	Q13-133	A47-500K-Z	B-60-S	U-48	Phonograph volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R5A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R5A
R6A	300KΩ	½	V333		AT-70			Treble tapped @ 200K
B	Shaft		Not Req.		FS-3			Attach to R6A
R7A	300KΩ	½	V282B					Anti-feedback & switch
B	7000Ω	½						
C	150KΩ	½						
R8A	500KΩ	½	V334	Q13-133	A47-500K-S	B-61	U-50	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R8A

RESISTORS

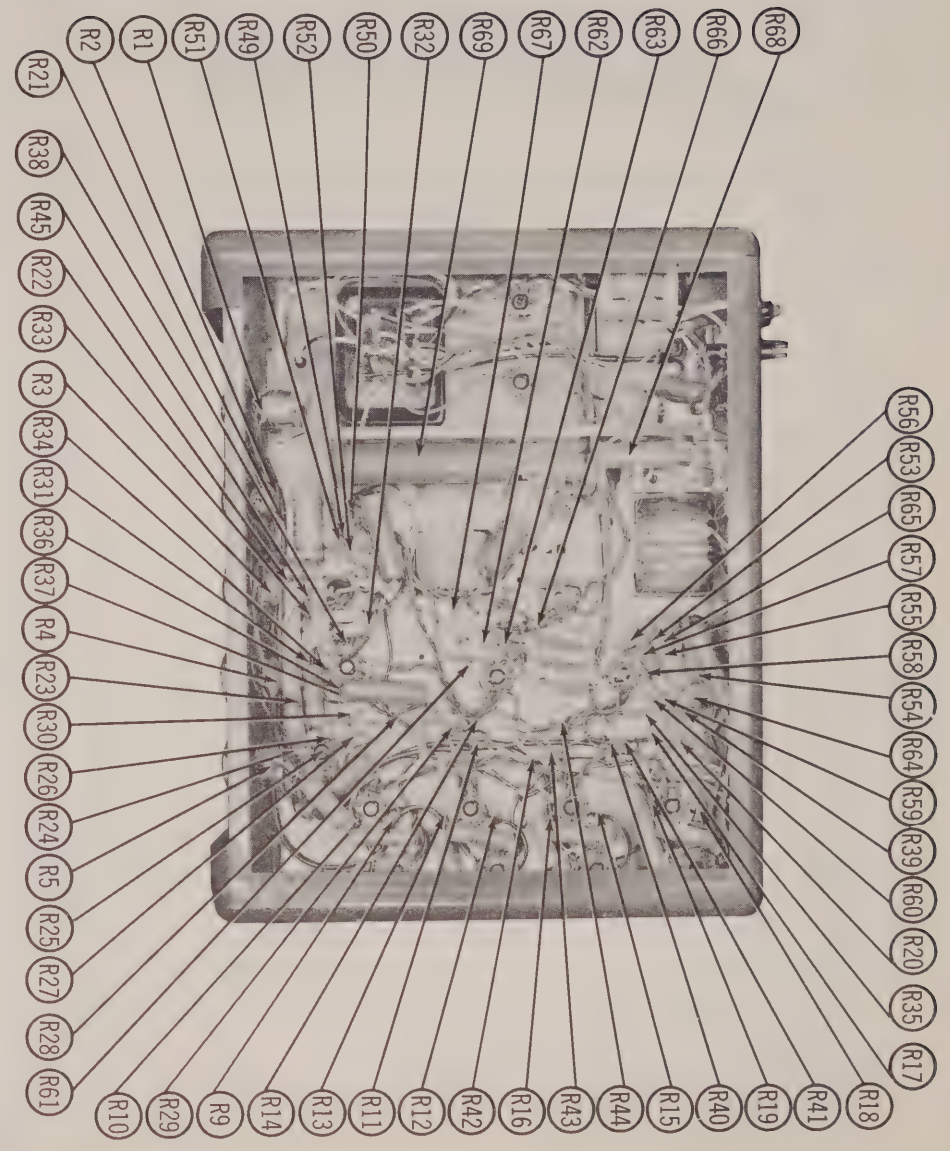
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R9	2.2Meg	½		BTS-2.2Meg	
R10	220KΩ	½		BTS-220K	
R11	47KΩ	½		BTS-47K	
R12	2.2Meg	½		BTS-2.2Meg	
R13	220KΩ	½		BTS-220K	
R14	47KΩ	½		BTS-47K	
R15	2.2Meg	½		BTS-2.2Meg	
R16	220KΩ	½		BTS-220K	
R17	47KΩ	½		BTS-47K	
R18	2.2Meg	½		BTS-2.2Meg	
R19	220KΩ	½		BTS-220K	
R20	47KΩ	½		BTS-47K	
R21	220KΩ	½		BTS-220K	
R22	220KΩ	½		BTS-220K	
R23	220KΩ	½		BTS-220K	
R24	220KΩ	½		BTS-220K	
R25	1000Ω	½		BTS-1000	
R26	100KΩ	½		BTS-100K	
R27	68KΩ	½		BTS-68K	
R28	47KΩ	½		BTS-47K	
R29	47KΩ	½		BTS-47K	
R30	100KΩ	½		BTS-100K	
R31	68KΩ	½		BTS-68K	
R32	470KΩ	½		BTS-470K	
R33	68KΩ	½		BTS-68K	
R34	1000Ω	½		BTS-1000	
R35	33KΩ	½		BTS-33K	
R36	1 Meg	½		BTS-1 Meg	
R37	2200Ω	½		BTS-2200	
R38	100KΩ	½		BTS-100K	
R39	33KΩ	½		BTS-33K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R40	220KΩ	½		BTS-220K	
R41	220KΩ	½		BTS-220K	
R42	220KΩ	½		BTS-220K	
R43	220KΩ	½		BTS-220K	
R44	220KΩ	½		BTS-220K	
R45	10KΩ 5%	½		BTS-10K 5%	
R46	20KΩ 5%	½		BTS-20K 5%	
R47	10KΩ 5%	½		BTS-10K 5%	
R48	20KΩ 5%	½		BTS-20K 5%	
R49	1 Meg	½		BTS-1 Meg	
R50	3300Ω	½		BTS-3300	
R51	100KΩ	½		BTS-100K	
R52	220KΩ	½		BTS-220K	
R53	220KΩ	½		BTS-220K	
R54	3300Ω	½		BTS-3300	
R55	470Ω	½		BTS-470	
R56	3900Ω	½		BTS-3900	
R57	39KΩ	½		BTS-39K	
R58	1 Meg	½		BTS-1 Meg	
R59	330KΩ	½		BTS-330K	
R60	270KΩ	½		BTS-270K	
R61	470KΩ	½		BTS-470K	
R62	470KΩ	½		BTS-470K	
R63	2200Ω	2		BTB-2200	
R64	2200Ω	½		BTS-2200	
R65	47KΩ	1		BTA-47K	
R66	1000Ω	2		BTB-1000	
R67	680Ω	½		BTS-680	
R68	1000Ω	20		2½DA-1000	
R69A	10KΩ	50			
B	40KΩ				

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @1.55A	1180VCT .130ADC	616VCT .049ADC @2A	5VAC @3A	T361-2					
			SEC. 4	SEC. 5						
			@2A	@5.1A						

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T2	142ΩCT	.0042A @ CT			T119					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.1	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T3	2.7KΩ CT	140V tap @ 70V SEC.2 15Ω, 8Ω, 4Ω	T256						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L1	.130A	51.6Ω	2.8 Hy.	T510	C-2304		C-13X		20C49 ②
L2	.049A	190Ω	5.5 Hy.	T501	C-1706	C-2975	C-6X ①	C5007	20C85 ①

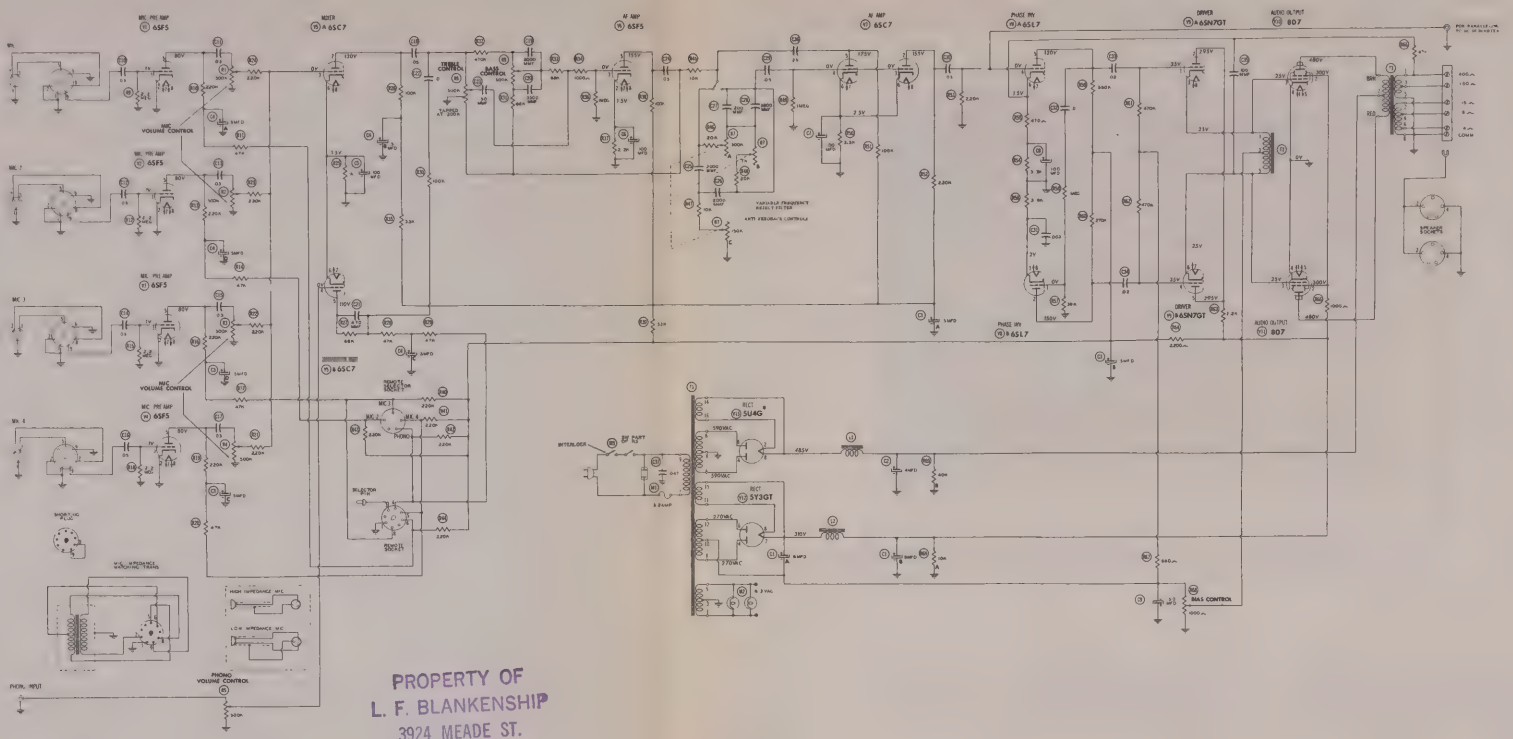
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			David Bogen PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG S/B	3.2A 125V			31303.2 (3AG S/B-3.2A)	342001	MDX3-2/10	HKP

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M2	Dial Light		#47 - 2 used
M3	Switch		Interlock



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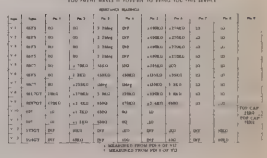
THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO REPRODUCE THIS SERVICE



* SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 cps per volt.
2. Socket connections are shown as bottom views.
3. Resistance values are in ohms unless otherwise designated.
4. Switches are shown in position for minimum voltage readings.
5. Recommended tolerances are measured in an a-c neutral position in accordance with the manufacturer's instructions.
6. All capacities are in mfd. unless otherwise designated.

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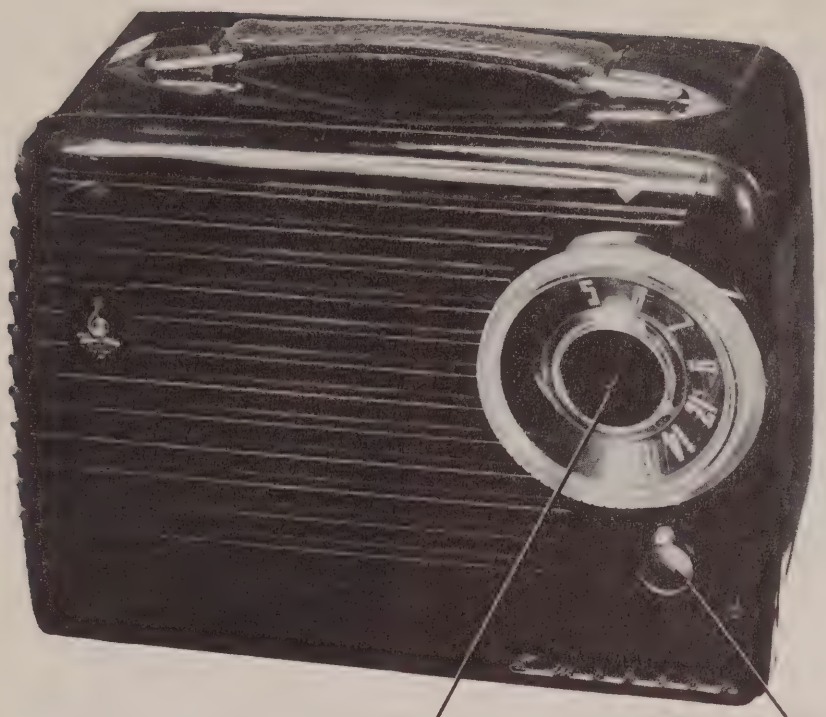
EMERSON
MODEL 790B (Ch. 120147-B)



EMERSON
MODEL 790B (Ch. 120147-B)

TRADE NAME	Emerson Model 790B (Ch. 120147-B)
MANUFACTURER	Emerson Radio & Phono Corp., 111 Eighth Ave., New York, N.Y.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Five)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output, 117Z3 Rectifier
POWER SUPPLY	110-120 Volts AC-DC (or) 4½ Volts "A" Supply & 90 Volts "B" Supply
RATING	.14 Amp. @ 117 V AC (or) 100 MA @ 4.5 Volts DC & 13 MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1602KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.005MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1630KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A5	"

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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 790B (Ch. 120147-B)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		EMERSON PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	
V5	Rectifier	117Z3	117Z3	4CB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	80	150	925192	AFH4-23		XC012		FP302.7	R1451	
B	30	150								
C	300	15								
C2	.05	200	923354	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.01	200	923314	P288-01	D6-103	PJ2S1	GP2-333-103	PT411	2TM-S1	
C4	.05	400	923554	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C5	.01	400	923314	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C6	2.2		915005	SI2.2	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C7	.1	200	923315	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C8A	200		†		D6-20	TP38	GP2K-201	UC-532		
B	1000				DD-102	TP52	801-001	DC-521		
C	100		928034	†PA-196	D6-101	TP34	GP1K-101	UC-531	†34C8	
D	10000				D6-103	K082	811-01	DC-511		
E	1000				DD-102	K069	801-001	DC-521		
C9	.002	600	923723	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C10	.05	200	923354	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C11	.05	400	923554	P488-05	DF-503	CUB4S5		PT415	4TM-S5	

† Items C8A, C8B, C8C, C8D and C8E are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	390241	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

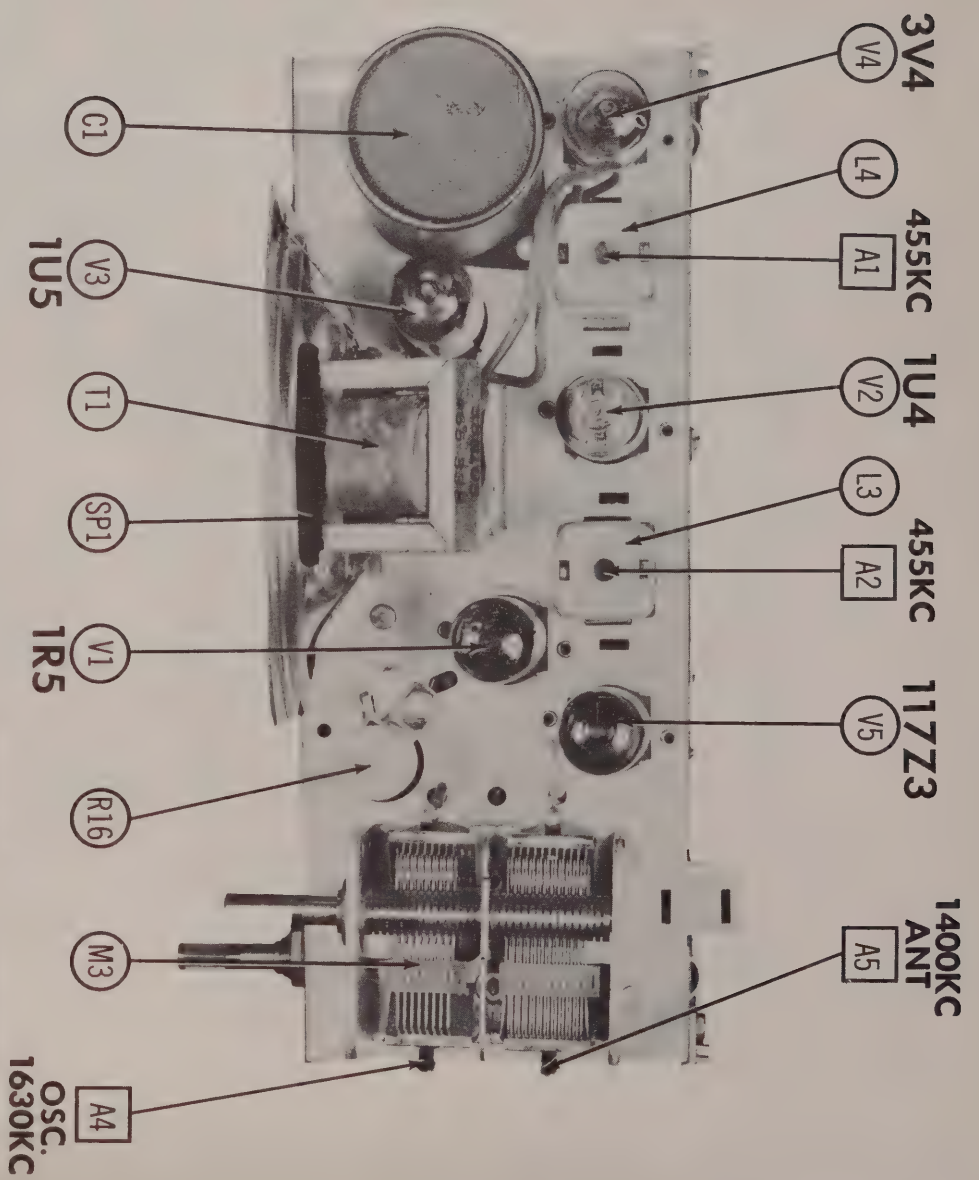
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R2	100KΩ	½	350972	BTS-100K	
R3	15KΩ	½	340772	BTS-15K	
R4	3.3Meg	½	351332	BTS-3.3Meg	
R5	2.2Meg	½	351292	BTS-2.2Meg	
R6	10Meg	½	351452	BTS-10Meg	
R7	4.7Meg	½	351372	BTS-4.7Meg	
R8	1Meg	½	341212	BTS-1Meg	
R9	3.3Meg	½	351332	BTS-3.3Meg	
R10	330Ω	½	340372	BTS-330	
R11	1000Ω	½	340492	BTS-1000	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	EMERSON PART No.	IRC PART No.	
R12	820Ω	½	340472	BTS-820	
R13	2200Ω	½		BTS-2200	Note 1
R14	2200Ω	½		BTS-2200	Note 1
R15	27Ω	1	370172		
R16	2200Ω 5%	10	394095		
R17	1500Ω	½	340532	BTS-1500	
R18	56Ω	½		BTS-56	Note 2
R19	56Ω	½		BTS-56	Note 2

Note 1. Some models may use a single 1000Ω resistor in this application.
Note 2. Some models may use a single 27Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	EMERSON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	9.8KΩ	3.2Ω	Part of speaker	A-2927	A-3329	S-11X	Z1110	24S49	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	180119	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.1Ω		700027				
L2	Osc. Coil	1.3Ω	6Ω	716085	14-1073		69-Osc. †	
L3	Input IF	20Ω	20Ω	720525	16-6758	BC-352	12-C1	
L4	Output IF	30Ω	22Ω	720066A	16-6758	BC-353	12-C2	

† Drill mounting hole.

BATTERIES

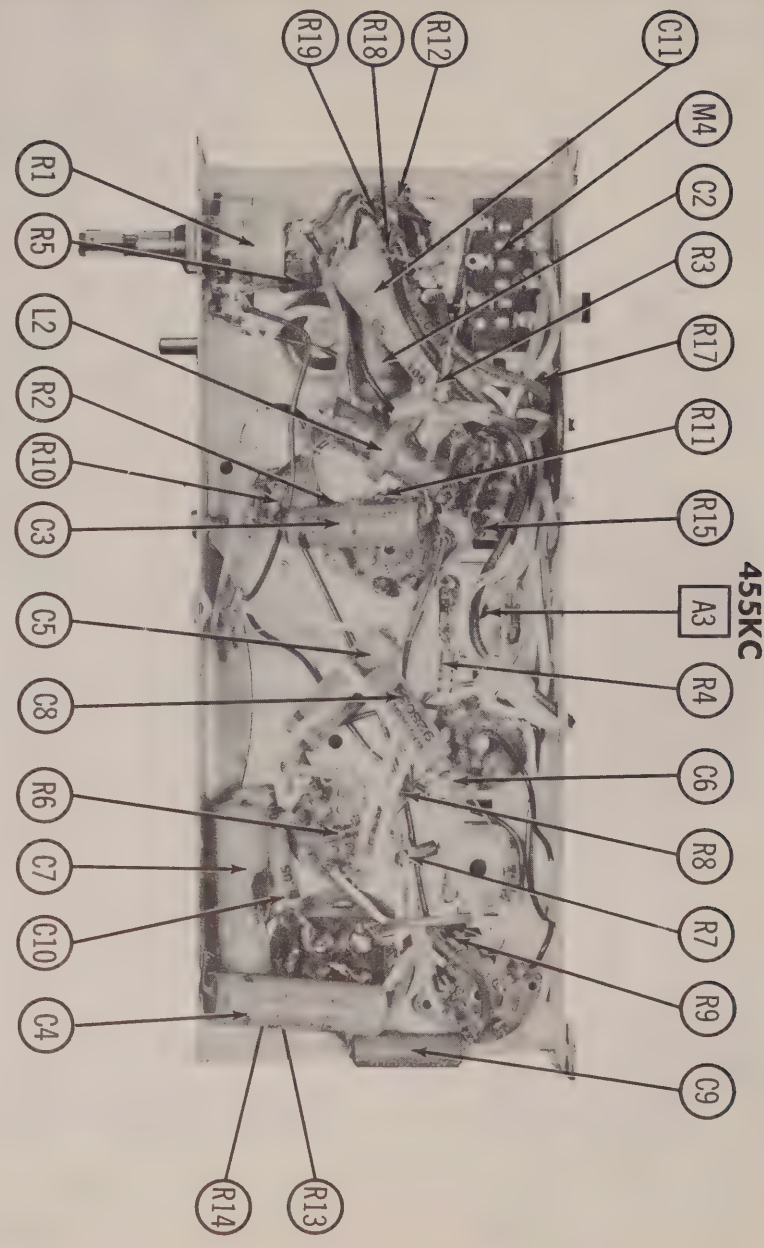
ITEM No.	VOLTAGE	EMERSON PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	4½ V	EM72	726			D3			
M2	90V	EM90		490			N-60		

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M3A	Tuning Cap.	900109	36-385 & 31-175MMF
B	Tuning Cap.	900112	Alternate
M4	Switch	510081	Power Change-over
	Cabinet	140566	Maroon
	Cabinet	140566A	French Gray
	Cabinet	140566B	Green
	Cabinet	140566C	Tan
	Cabinet	140566D	Cloud Grey
	Cabinet	140566E	Ebony
	Cabinet Back	460525	Maroon
	Cabinet Back	460525A	French Gray
	Cabinet Back	460525B	Green
	Cabinet Back	460525C	Tan
	Cabinet Back	460525D	Cloud Gray
	Cabinet Back	460525E	Ebony
	Knob	460532	Volume - Black & gold
	Knob	460526 *	Tuning - Gold, use with 900109 tuning cap.
	Knob	460548 ♦	Tuning - Gold, use with 900112 tuning cap.
	Handle	595005	Black

* Identified by circles at base of shaft.
♦ Identified by circled cross hatch markings at base of shaft.

CHASSIS—BOTTOM VIEW



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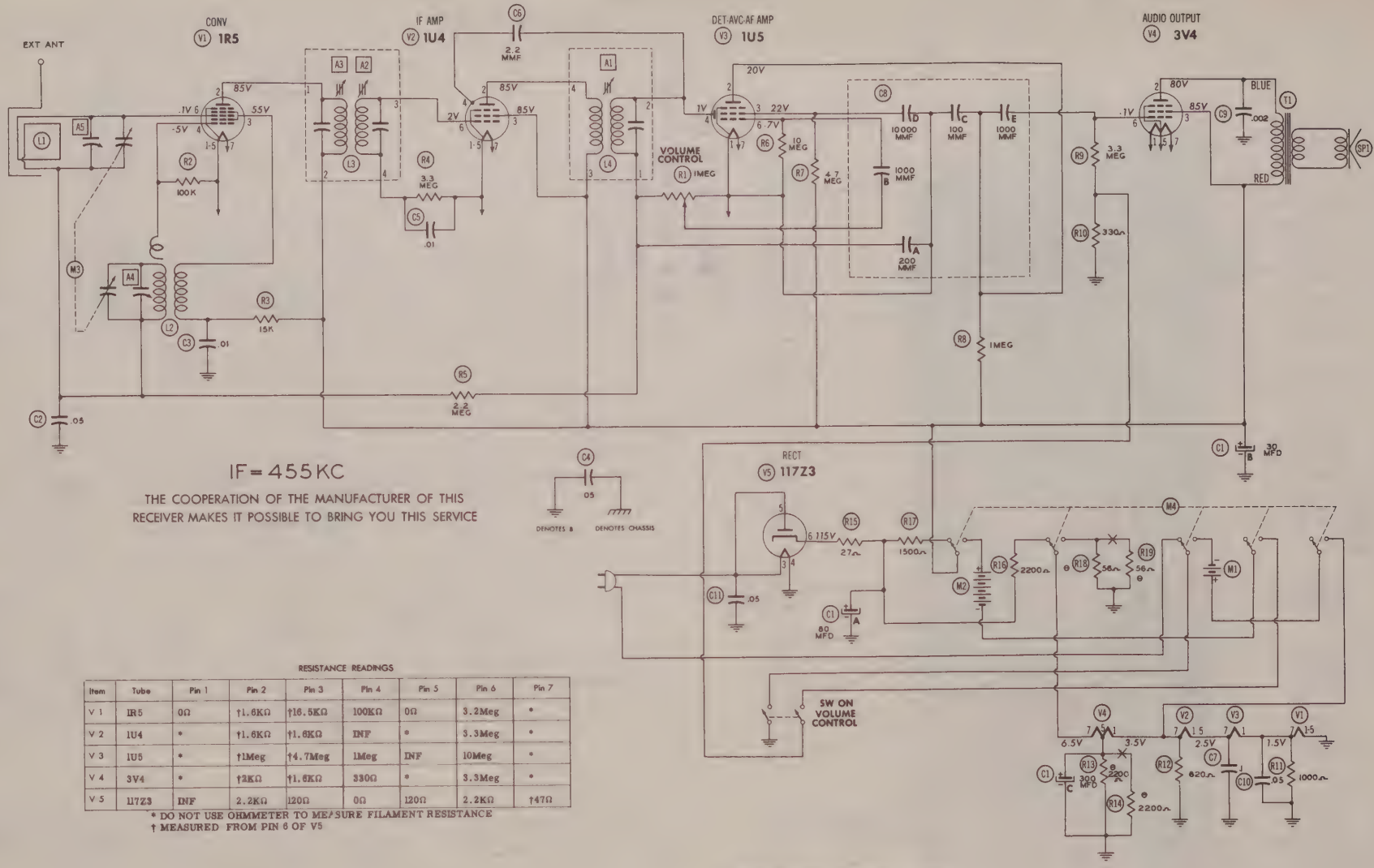
EMERSON
MODEL 790B (Ch. 120147-B)



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	0Ω	†1.6KΩ	†16.5KΩ	100KΩ	0Ω	3.2Meg	*
V 2	1U4	*	†1.6KΩ	†1.6KΩ	INF	*	3.3Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	INF	10Meg	*
V 4	3V4	*	†2KΩ	†1.6KΩ	330Ω	*	3.3Meg	*
V 5	117Z3	INF	2.2KΩ	120Ω	0Ω	120Ω	2.2KΩ	†47Ω

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
† MEASURED FROM PIN 6 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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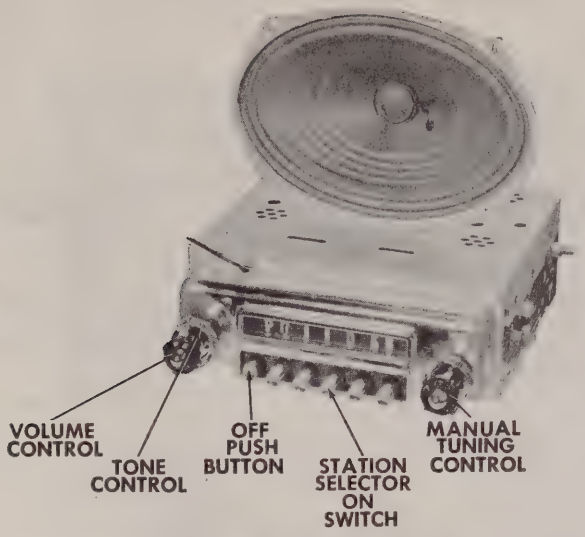

TRADE NAME	Ford Model 4SF765 (FDA-18805-A) (For 1954 Ford Automobiles)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Tel. Div., 254 Rano St., Buffalo 7, N.Y.
TYPE SET	Battery Operated Custom Built Automobile AM Superheterodyne Receiver
TUBES (Eight)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AF Amp., 6AV6 AVC-Phase Inv., (2) 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 6.9 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Connect the negative side of a 7.2 volt source to the "A" lead. Connect the positive side to chassis. The top and bottom covers should be in place during alignment. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain and output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	265KC (400%Mod)	Quiet point on dial	Across voice coil	A1, A2, A3, A4	Adjust in order given until maximum output is obtained.
2.	Fig. 1	Thru dummy (Fig.1) to antenna receptacle.	1610KC	High frequency end stop	"	A5, A6, A7	Adjust in order given until maximum output is obtained. Check dial calibration. If necessary, correct calibration with dial pointer adjustment screw. If tuning cores have been tampered with continue alignment with step 3. If tuning core alignment is unnecessary, omit step 3.
3.	"	"	1000KC	1000KC	"	A8, A9, A10	Adjust in order given for maximum output. Repeat steps 2 and 3.
4.	With radio installed in car and antenna fully extended tune in a weak station near 1000KC and adjust A7 for maximum volume.						

SENSIVITY CONTROL ADJUSTMENT

The sensitivity control (R2) will require adjustment only if the control has been tampered with or becomes defective. Adjust R2 for 4.5 volts DC at pin 7 (cathode) of 6BD6 (V3).

PUSH BUTTON ADJUSTMENT

Tune manually to the desired station. Turn the selected push button knob one full turn counter clockwise and press the push button all the way in and release. Turn the push button knob clockwise as far as possible. Repeat above procedure for remaining push buttons.

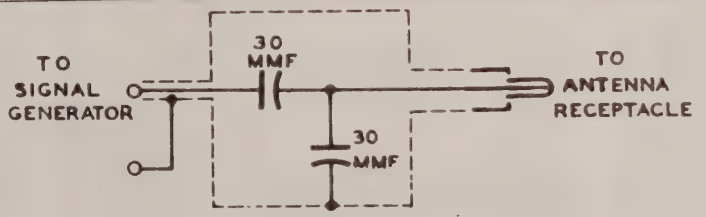

FIG. 1

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FORD MODEL
4SF765 (FDA-18805-A)

PARTS LIST AND DESCRIPTIONS

FORD
MODEL 4SF765 (FDA-18805-A)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det-AF Amplifier	6AV6	6AV6	7BT	
V5	AVC-Phase Inverter	6AV6	6AV6	7BT	
V6	Audio Output	6AQ5	6AQ5	7BZ	
V7	Audio Output	6AQ5	6AQ5	7BZ	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■20	350	161-3005	AFH3-107		C080		FP330	TVL-3636	
B	▲20	350								
C	20	25								
C2	.047	200	160-02147	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C3	10000		168-0002D	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4	150	500	164-0150	1468-00015		5W5T15		MCB236	1FM-315	
C5	.1	400	160-0401	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C6	33		163-0033	SI33NP0	TCZ-33	Z029	NP0K-330	ZT-5433	5TCC-Q33	
C7	18	500	164-0018			5W5Q18			MS-415	
C8	230		165-0230A							
C9	.1	200	160-0201	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C10	10	500	164-0010	1468-00001		5W5Q1		MCB215	MS-41	
C11	.015	200	160-06115	P288-15		PJ2P15		PT4015	2TM-P15	
C12	.0047	600	160-04247	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C13	.0056	400	160-04256	P688-0056	D6-562	CUB6D56	GP2-333-562	PT6256	6TM-D56	
C14	220	500	163-0220	1468-0002		5W5T22		MCB237	1FM-32	
C15	220	500	163-0220	1468-0002		5W5T22		MCB237	1FM-32	
C16	10000		168-0002D	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C17	.022	600	160-06122	P688-022		CUB6S22		PT6122	6TM-S22	
C18	.022	600	160-06122	P688-022		CUB6S22		PT6122	6TM-S22	
C19	.5	100	169-0001	VHC-36		MP2P5		RF-480	2TM-P5	
C20	.0082	1600	160-16282							
C21	Feed-thru		169-0017							

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.5Meg	½	154-0006				UF155L	Tone-Panel
B	1 Meg	½					UR16-T35 †	Volume-Rear tapped @ 500K
C	Shaft						EB-214	Attach to R1A
R2	2000Ω	1	159-0004		39-2000			Sensitivity-wire wound

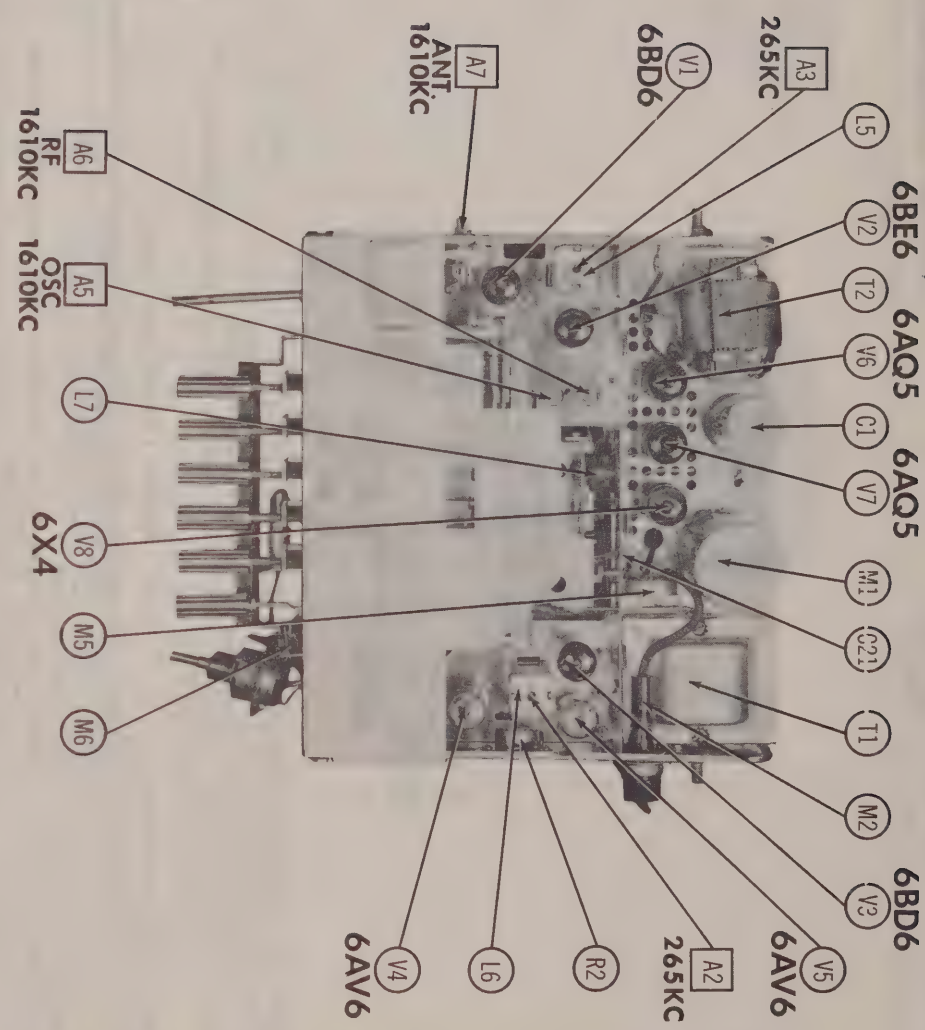
† Round out hole in chassis so to accomodate a round bushing.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SYLVANIA PART No.	IRC PART No.	NOTES
R3	1 Meg	½	181-0105	BTS-1 Meg	
R4	10KΩ	1	182-0103	BTA-10K	
R5	330KΩ	½	181-0334	BTS-330K	
R6	47KΩ	½	181-0473	BTS-47K	
R7	15 Meg	½	181-0156	BTS-15 Meg	
R8	39KΩ	½	181-0393	BTS-39K	
R9	12KΩ	2	183-0123	BTB-12K	
R10	33KΩ	½	181-0104	BTS-33K	
R11	220KΩ	½	181-0224	BTS-220K	
R12	47KΩ	½	181-0473	BTS-47K	
R13	470KΩ	½	181-0474	BTS-470K	
R14	47Ω	½	181-0470	BTS-47	
R15	15 Meg	½	181-0156	BTS-15 Meg	
R16	330KΩ	½	181-0334	BTS-330K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SYLVANIA PART No.	IRC PART No.	NOTES
R17	1500Ω	½	181-0152	BTS-1500	
R18	1 Meg	½	181-0105	BTS-1 Meg	
R19	1 Meg	½	181-0105	BTS-1 Meg	
R20	2700Ω	½	181-0272	BTS-2700	
R21	6.8Meg	½	181-0685	BTS-6.8Meg	
R22	330KΩ	½	181-0334	BTS-330K	
R23	47KΩ	½	181-0473	BTS-47K	
R24	150KΩ	½	181-0154	BTS-150K	
R25	390Ω	1	182-0391	BT -390	
R26	220KΩ	½	181-0224	BTS-220K	
R27	150KΩ	½	181-0154	BTS-150K	
R28	1800Ω	2	189-0012	BTB-1800	
R29	150Ω	1	181-0151	BTA-150	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VCT @3.5A	475VCT .053A			141-0025		P-3068			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SYLVANIA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	8.4KΩ	3.5Ω	143-0024	A-3856 ①	A-2900	S-51X①			① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SYLVANIA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.5Ω	539-0001	ST-810 Mod. P69-V	69A2	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	13Ω		111-0019				Wound on Cap.
L2	IF Trap			118-0008				
L3	RF Coil	13Ω		112-0011				
L4	Osc. Coil	1.1Ω	5Ω	113-0024				
L5	Input IF	35Ω	36Ω	121-0020	16-6752	BC-350	12-H1	
L6	Output IF	42Ω	42Ω	122-0022	16-6754	BC-354	12-H6	
L7	Fil. Choke	0Ω		145-0007				
L8	Vibrator Hash Choke	0Ω		147-0007		BC-537	5221	11 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				SYLVANIA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interruptor	6.3V	115 ~	511-0001	5301	859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SYLVANIA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	191-0002	562-0006	307014. (SFE-14A)	155014	SFE14	HDI

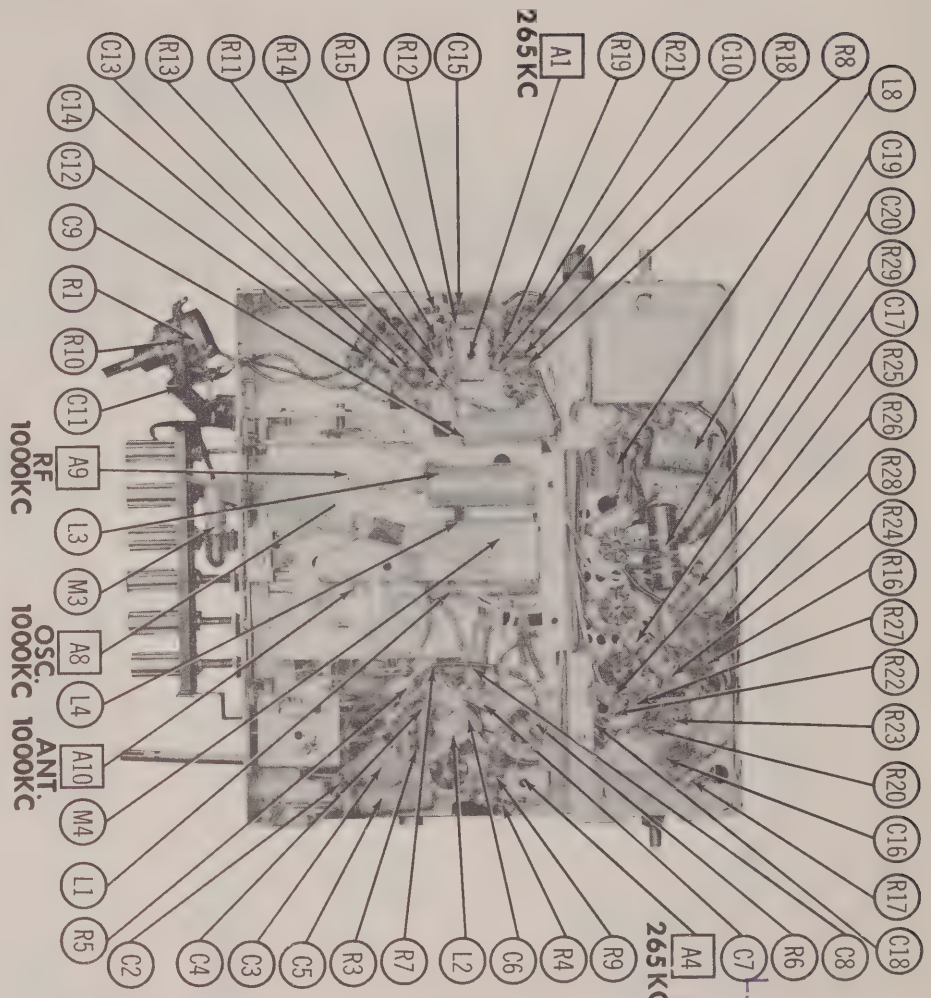
MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	Dial Light	611-0044	#44 Bayonet
M4	Tuning Unit	117-0015	Permeability assembly
M5	Switch	571-0004	Off/on
M6	Switch	577-0003	Dimmer (Dial Light)
	Trimmer Cap.	172-0033	Antenna
	Trimmer Cap.	173-0002	Dual RF and Osc.
	Knob	744-0020	Tone & dummy
	Knob	740-0050	Tuning & volume
	Tuning Assy.	313-0030	Mechanical, push buttons, driven clutch disc, crown gear and mechanical tuning shaft.
	Button	752-0027	Push & screw assembly
	Dial	722-0033	

SET 255 FOLDER 6

FORD MODEL 45F765 (FDA-18805-A)

CHASSIS—BOTTOM VIEW



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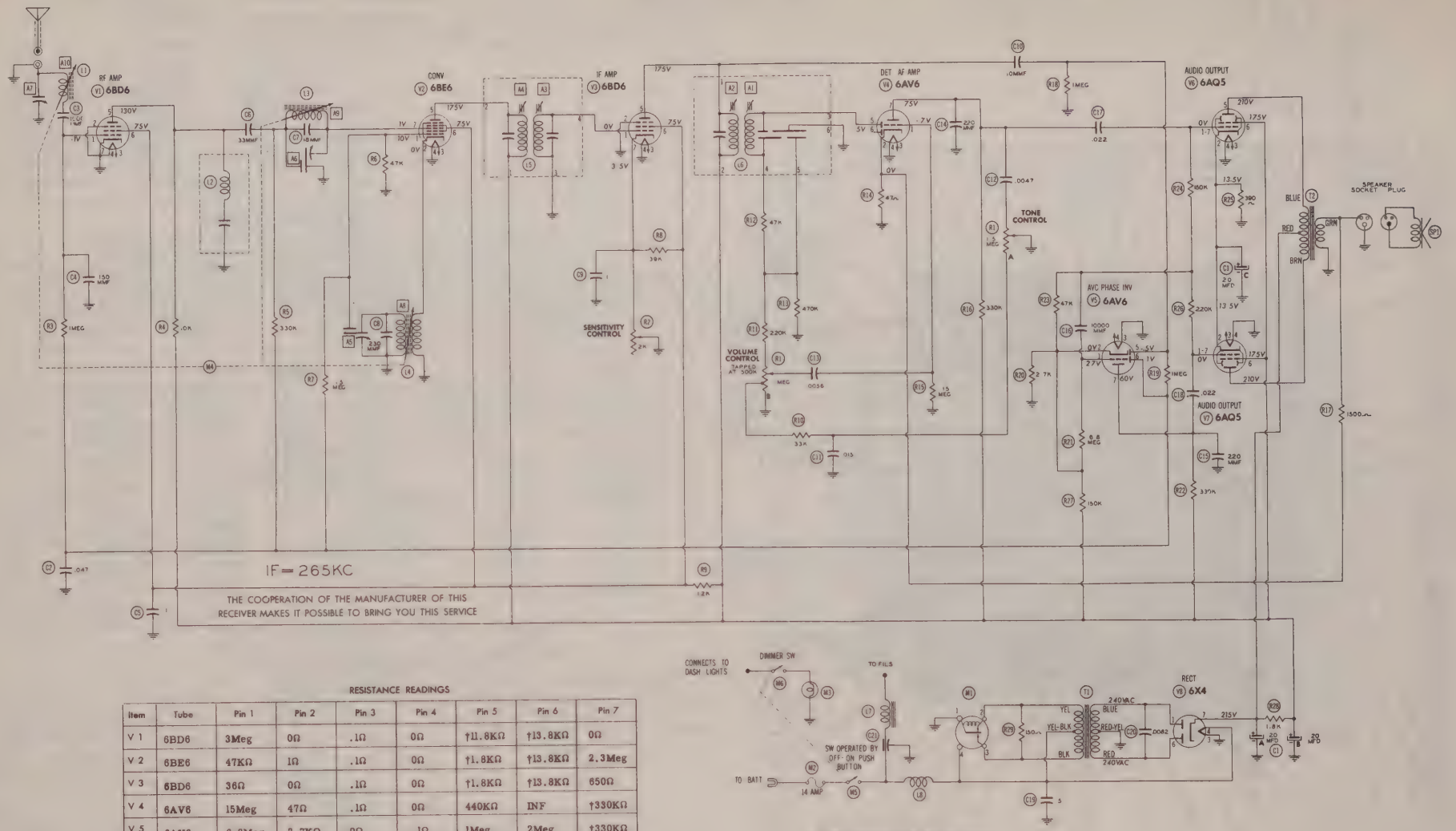
FORD MODEL 45F765 (FDA-18805-A)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	3Meg	0Ω	.1Ω	0Ω	†11.8KΩ	†13.8KΩ	0Ω
V 2	6BE6	47KΩ	1Ω	.1Ω	0Ω	†1.8KΩ	†13.8KΩ	2.3Meg
V 3	6BD6	36Ω	0Ω	.1Ω	0Ω	†1.8KΩ	†13.8KΩ	650Ω
V 4	6AV6	15Meg	47Ω	.1Ω	0Ω	440KΩ	INF	†330KΩ
V 5	6AV6	6.8Meg	2.7KΩ	0Ω	.1Ω	1Meg	2Meg	†330KΩ
V 6	6BQ5	200KΩ	390Ω	.1Ω	0Ω	†210Ω	†1.8KΩ	200KΩ
V 7	6AQ5	270KΩ	390Ω	.1Ω	0Ω	†210Ω	†1.8KΩ	270KΩ
V 8	6X4	200Ω	INF	0Ω	.1Ω	INF	225Ω	45KΩ

† MEASURED FROM PIN 7 OF V8

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured voltages are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Normal variations in components and tubes make possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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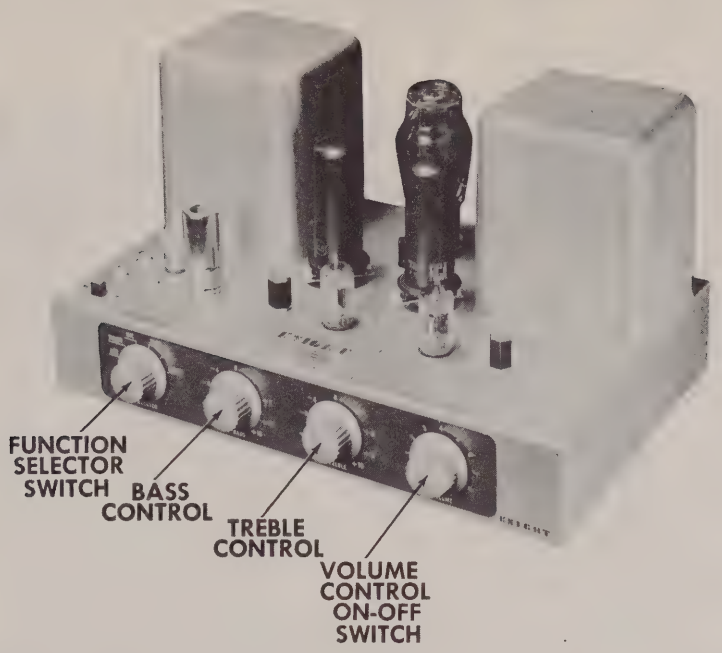
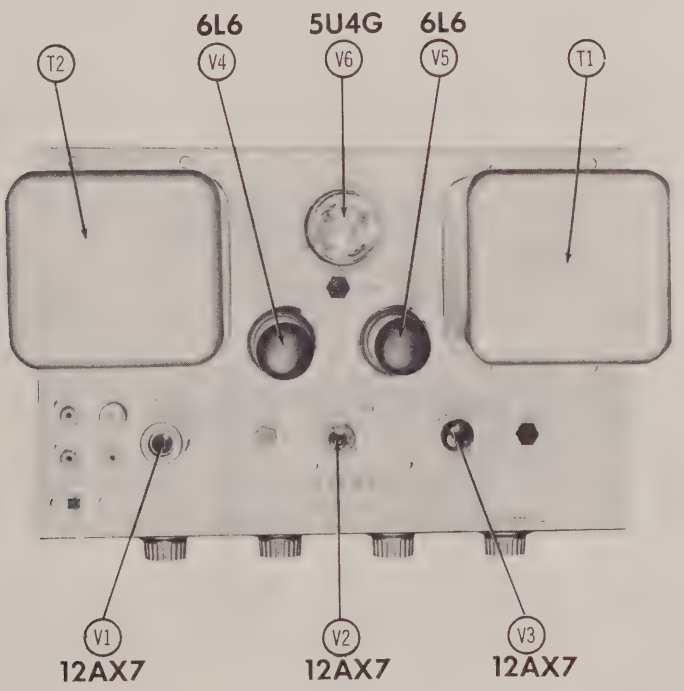
KNIGHT
MODEL 93SX321



TRADE NAME	Knight Model 93SX321
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill.
TYPE SET	AC Operated 4 Channel 24 Watt Audio Amplifier
TUBES (Six)	Types 12AX7 Pre-Amp., 12AX7 AF Amp., 12AX7 AF Amp.-Phase Inv., (2) 6L6G Audio Output, 5U4G Rectifier
POWER SUPPLY	110-130 Volts AC-50/60 Cycles RATING 1.14 Amp. @ 117 Volts AC



CHASSIS—TOP VIEW

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PARTS LIST AND DESCRIPTIONS

KNIGHT
MODEL 93SX321

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		KNIGHT PART No.	STANDARD REPLACEMENT		
V1	Pre-Amplifier	12AX7	12AX7	9A	
V2	AF Amplifier	12AX7	12AX7	9A	
V3	AF Amplifier - Phase Inverter	12AX7	12AX7	9A	
V4	Audio Output	6L6G	6L6G	7S	
V5	Audio Output	6L6G	6L6G	7S	
V6	Rectifier	5U4G	5U4G	5T	

CAPACITORS

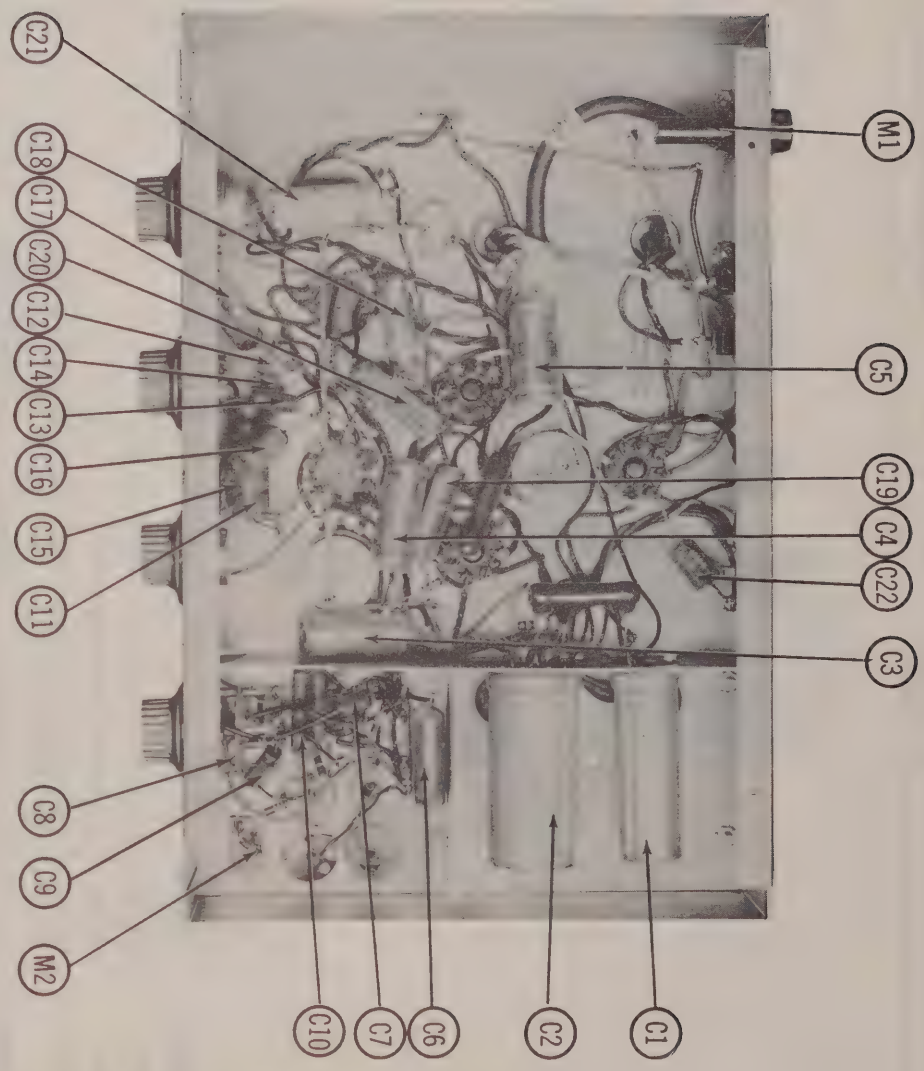
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	30	500		AFH1-60		A054			TVL-1810	
C2A	▬40	450		AFH4-17		D016		FP434.5 TC-75	R1442	
B	■10	450								
C	▲10	450								
D	10	450								
C3	8	450		PRS450/8		BR845		TC71	TVA-1704	
C4	40	25		PRS25/50		BR502		TC29	TVA-1206	
C5	30	150		PRS150/30		BR3015		TC47	TVA-1412	
C6	.047	600		P688-047	DF-503	CUB6S47		PT615	6TM-S5	
C7	.0033	400		P488-0033	D6-332	CUB4D33	GP2-333-332	PT4233	4TM-D33	
C8	.001	600		P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C9	.0022	600		P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C10	.047	600		P688-047	DF-503	CUB6S47		PT615	6TM-S5	
C11	.22	600		P688-22		CUB6P22		PT6022	6TM-D22	
C12	330	500		1468-00035		5R5T33		MCB241	1FM-335	
C13	.0033	600		P688-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C14	15	500				22R5Q15			MS-415	
C15	.0056	400								
C16	.056	200								
C17	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C18	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C19	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C20	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C21	.05	600		689ZX-047		PJ6S5		MCB225	MS-45	
C22	47	500		1468-00005		22R5Q47		MCB225	MS-45	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	KNIGHT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	RP-504W-A	Q13-133	A47-500K-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	500KΩ	½	RP-504B-D	Q13-133	A47-500K-Z	BSK-60	U-48	Treble
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	RP-504B-D	Q13-133	A47-500K-Z	BSK-60	U-58	Bass
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R3A
R4A	1000Ω	2	RPW-102B	WK-1000	A43-1000	VK-129	R1000L	Hum balance-wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	100Ω	2	RPW-101B	W-100	A43-100	VK-121	R100L	Bias
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	100Ω	2	RPW-101B	W-100	A43-100	VK-121	R100L	Tube balance
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R6A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R7	22KΩ	½		BTS-22K	
R8	27KΩ	½		BTS-27K	
R9	1 Meg	½		BTS-1 Meg	
R10	1500Ω	½		BTS-1500	
R11	220KΩ	½		BTS-220K	
R12	100KΩ	½		BTS-100K	
R13	100KΩ	½		BTS-100K	
R14	470KΩ	½		BTS-470K	
R15	1500Ω	½		BTS-1500	
R16	47KΩ	½		BTS-47K	
R17	10KΩ	½		BTS-10K	
R18	470KΩ	½		BTS-470K	
R19	470KΩ	½		BTS-470K	
R20	22KΩ	½		BTS-22K	
R21	10KΩ	½		BTS-10K	
R22	10KΩ	½		BTS-10K	
R23	47KΩ	½		BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	KNIGHT PART No.	IRC PART No.	
R24	2700Ω	½		BTS-2700	
R25	47KΩ	½		BTS-47K	
R26	1500Ω	½		BTS-1500	
R27	220KΩ	½		BTS-220K	
R28	3000Ω	½		BTS-3000	
R29	270KΩ	½		BTS-270K	
R30	470KΩ	½		BTS-470K	
R31	680Ω	½		BTS-680	
R32	47KΩ	½		BTS-47K	
R33	47KΩ	½		BTS-47K	
R34	33KΩ	½		BTS-33K	
R35	470KΩ	½		BTS-470K	
R36	250Ω	10		1 3/4A-250	
R37	470KΩ	½		BTS-470K	
R38	10KΩ	½		BTS-10K	
R39	6000Ω	10		1 3/4A-6000	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	KNIGHT PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @2.14A	840VCT .114ADC	5VAC @3A	6.3VAC @3A	LP-0232	P-6143 ①			P9400 ①	

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	KNIGHT PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	5.3KΩ	16Ω tap @ 8Ω	L0-0130	A-8053 ①		S-35A ①	H4101 ①		① Drill new mounting hole.

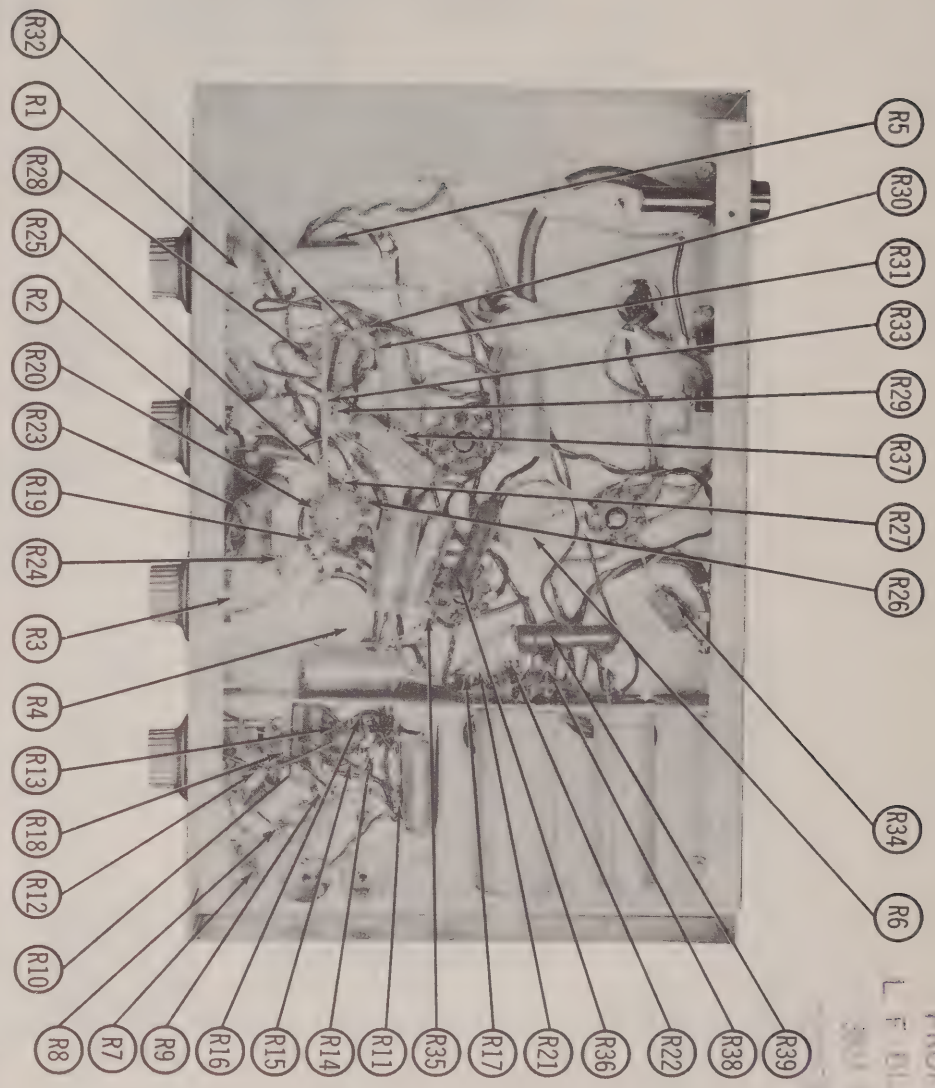
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			KNIGHT PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3A 250V			312003 (3AG-3A)	341001	AGC3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M2	Switch		Band

CHASSIS—BOTTOM VIEW



KNIGHT MODEL 93SX321

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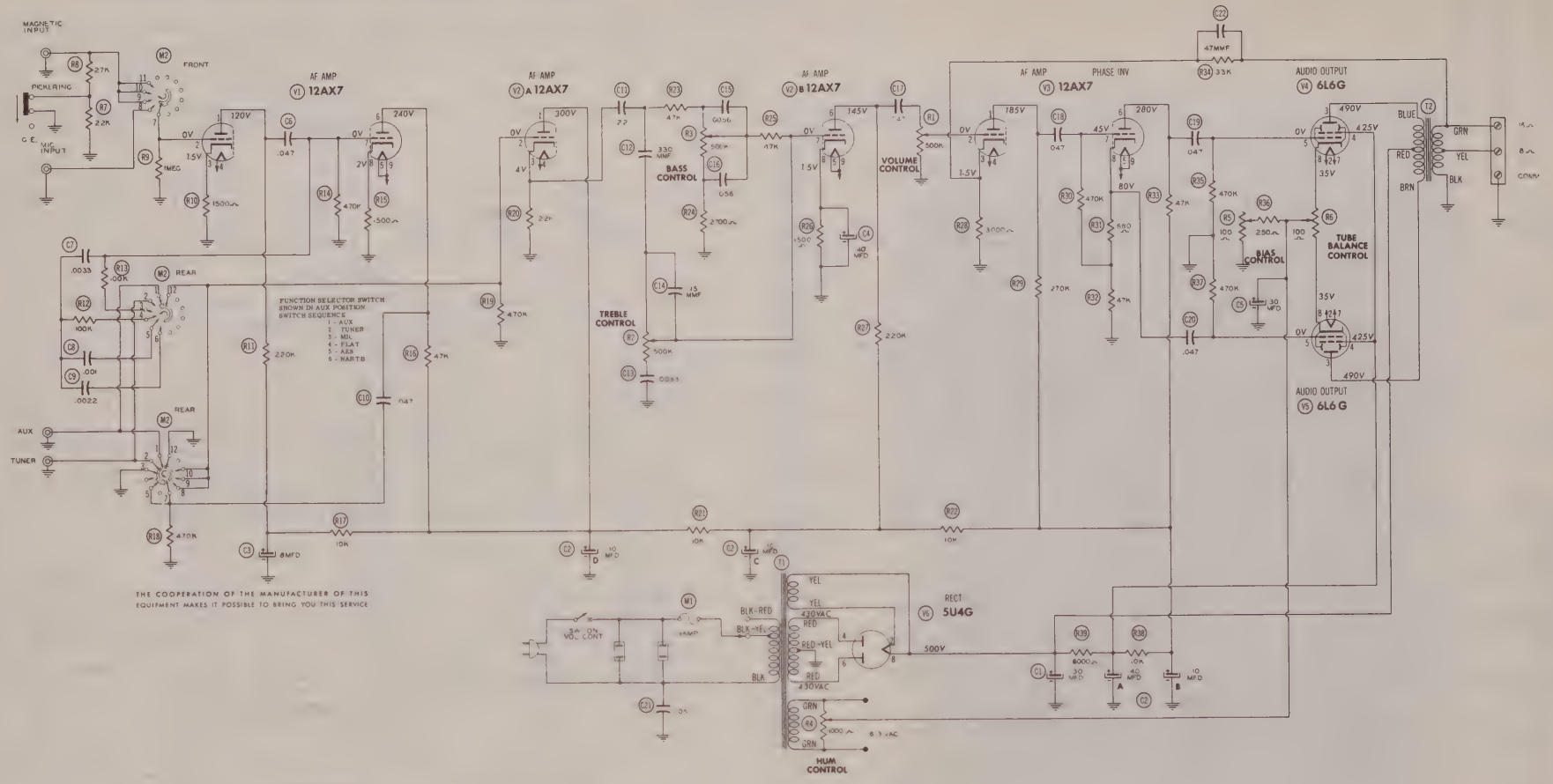
300 GAGE ST
COLORADO

SET 255 FOLDER 7

KNIGHT MODEL 93SX321



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†265KΩ	1Meg	1.5KΩ	550Ω	550Ω	†83KΩ	470KΩ	1.5KΩ	550Ω
V 2	12AX7	†36KΩ	470KΩ	22KΩ	550Ω	550Ω	†245KΩ	100KΩ	1.5KΩ	550Ω
V 3	12AX7	†285KΩ	45Ω	3KΩ	550Ω	550Ω	†63KΩ	520KΩ	47KΩ	550Ω
V 4	6L6	†53KΩ	550Ω	†100Ω	†6KΩ	470KΩ	68Ω	550Ω	370Ω	
V 5	6L6	0Ω	550Ω	†100Ω	†6KΩ	470KΩ	63KΩ	550Ω	370Ω	
V 6	5U4G	INF	100KΩ	INF	53Ω	INF	49Ω	38KΩ	100KΩ	

† MEASURED FROM PIN 8 OF V6

1. DC voltages measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom views.
4. Measured voltages are from indicated pin to common negative.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance on components unless marked otherwise is ±10%. Use ±20% ratings and resistance readings.
7. All controls at minimum, proper output load connected.

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MASCO
MODEL CM-10

MASCO
MODEL CM-10

TRADE NAME	Masco Model CM-10
MANUFACTURER	Mark Simpson, Mfg. Co., Inc., 32-28 49th St., Long Island City 3, N.Y.
TYPE SET	AC Operated 4 Channel 10 Watt Audio Amplifier
TUBES (Six)	Types 12AX7 Pre-Amp., 12AX7 AF Amp., 12AX7 AF Amp.-Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .56 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

MASCO MODEL CM-10

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MASCO PART No.	STANDARD REPLACEMENT		
V1	Pre Amplifier	12AX7	12AX7	9A	
V2	AF Amplifier	12AX7	12AX7	9A	
V3	AF Amplifier Phase Inverter	12AX7	12AX7	9A	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

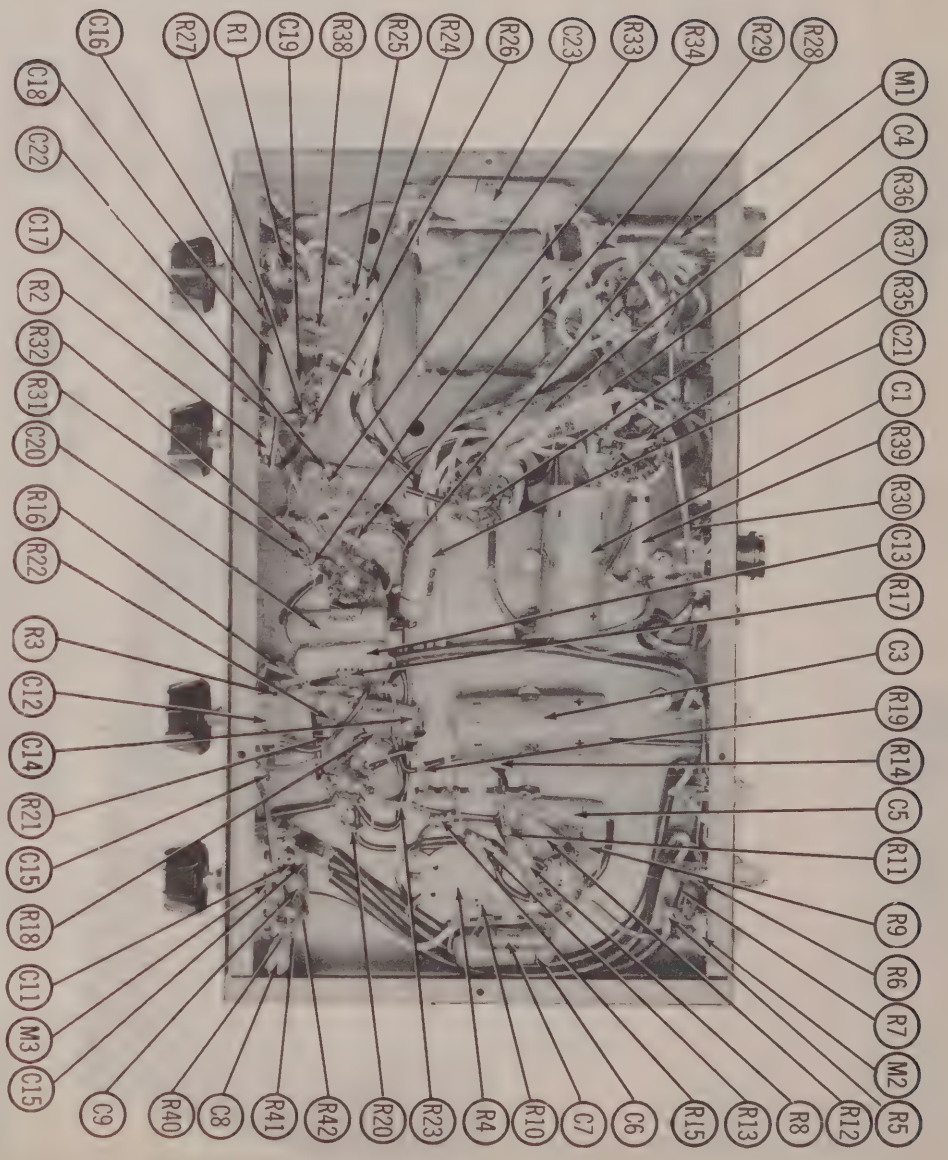
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	16	450		PRS450/16		BR1645		TC74	TVA-1708	
C2A	10	450		AFH4-14		D013		FP444	TVL-4763	
B	▲20	450								
C	■20	450								
D	▲10	450								
C3	16	450		PRS450/16		BR1645		TC74	TVA-1708	
C4	50	50		PRS50/50		BR505		TC39	TVA-1308	
C5	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C6	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C7	.002	600		P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C8	.005	600		P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C9	.001	600		P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C10	.001	600		P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C11	500	500		1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	Note 1
C12	150	500		1468-00015	D6-151	5W5T15	GP2K-151	MC236	1FM-315	
C13	.05	200		P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C14	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C15	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C16	.001	600		P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C17	.001	600		P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	Note 2
C18	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	Note 3
C19	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C20	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C21	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C22	.05	600		P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C23	.1	600		689ZX-1		CUB6P1		PT601	6TM-P1	

Note 1. Some models use 470MMF in this application.
Note 2. Some models use .002MFD in this application.
Note 3. Some models use .03MFD in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	18C2000	Q13-133	A47-500K-Z	B-60-S	U-48	Treble
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	U8-26	Attach to R1A
R2A	500KΩ	½	BA011-743	Q13-133	A47-500K-Z	B-60	U-48	Bass
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½		Q18-133X	AT-68	BT-63	UT-429	Volume tapped @ 50K
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A
R4A	50Ω	2		W-50	A43-50		C50P	Hum wire wound
B	Shaft			Not Req.	RS-2		Not Req.	Attach to R4A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MASCO PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R5	27KΩ	½		BTS-27K	
R6	27KΩ	½		BTS-27K	
R7	47KΩ	½		BTS-47K	
R8	4700Ω	1		BTA-4700	
R9	51KΩ	1			
R10	100KΩ	½		BTS-100K	
R11	100KΩ	½		BTS-100K	
R12	4700Ω	1		BTA-4700	
R13	470KΩ	1		BTA-470K	
R14	270KΩ	½		BTS-270K	
R15	47KΩ	½		BTS-47K	
R16	27KΩ	½		BTS-27K	
R17	47KΩ	½		BTS-47K	Note 1
R18	4700Ω	½		BTS-4700	
R19	270KΩ	½		BTS-270K	
R20	1 Meg	½		BTS-1 Meg	
R21	100KΩ	½		BTS-100K	
R22	3300Ω	½		BTS-3300	Note 2
R23	270KΩ	½		BTS-270K	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA MASCO PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R24	47KΩ	½		BTS-47K	Note 3
R25	10KΩ	½		BTS-10K	Note 1
R26	150KΩ	½		BTS-150K	
R27	10KΩ	½		BTS-10K	
R28	2700Ω	½		BTS-2700	
R29	270KΩ	½		BTS-270K	
R30	47KΩ	½		BTS-47K	
R31	100KΩ	½		BTS-100K	
R32	2200Ω	½		BTS-2200	
R33	47KΩ	½		BTS-47K	
R34	47KΩ	½		BTS-47K	
R35	470KΩ	½		BTS-470K	
R36	250Ω	4			
R37	470KΩ	1		BTS-470K	
R38	4700Ω	2		BTS-4700	
R39	10KΩ	2		BTB-10K	
R40	100KΩ	½		BTS-100K	
R41	150KΩ	½		BTS-150K	
R42	27KΩ	½		BTS-27K	

Note 1. Not used in all Models.
Note 2. Some models may use a 2200Ω resistor in this application.
Note 3. Some models may use a 27KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA MASCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.56A	635VCT .074ADC	5VAC @2A	6.3VAC @1.82A	A-8-D	PM-8409	P-2952	R-11B	P9311	TS-24R04

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MASCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	7.8KΩ CT	16Ω tap @ 8Ω, 4Ω		A-3311①	A-3101①②	S-31A ①	H4103 ①	T-22S93	① Drill new mounting holes. ② Use 6.6KΩ Pri. taps only. Tape 10KΩ taps.

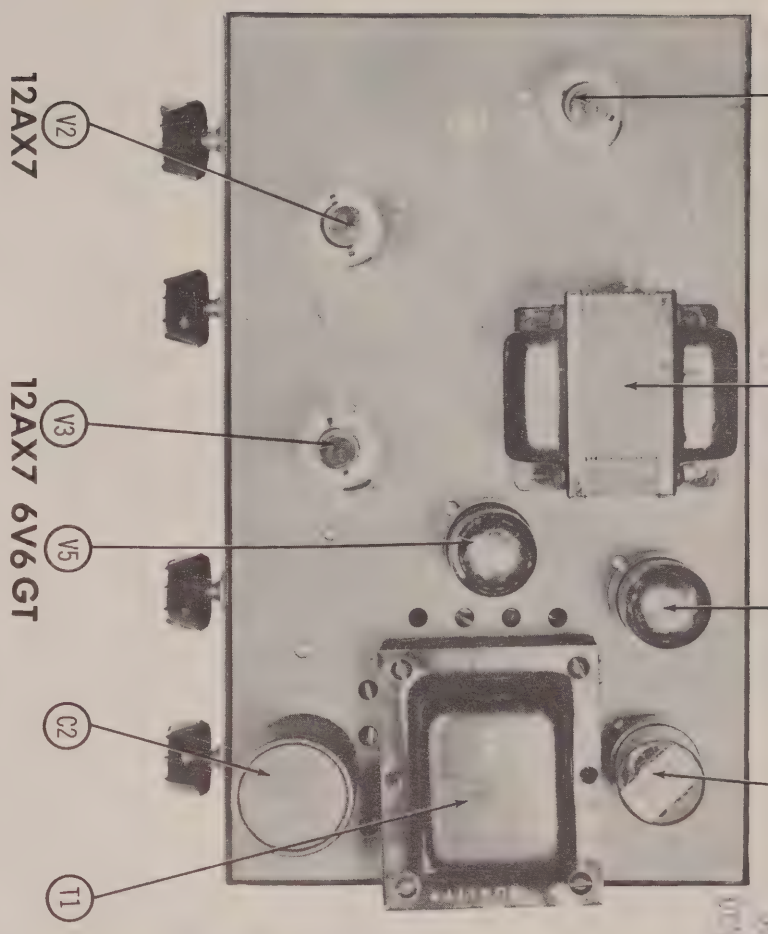
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA MASCO PART No. FUSE	MASCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A			312003	341001	AGC 3	HKP

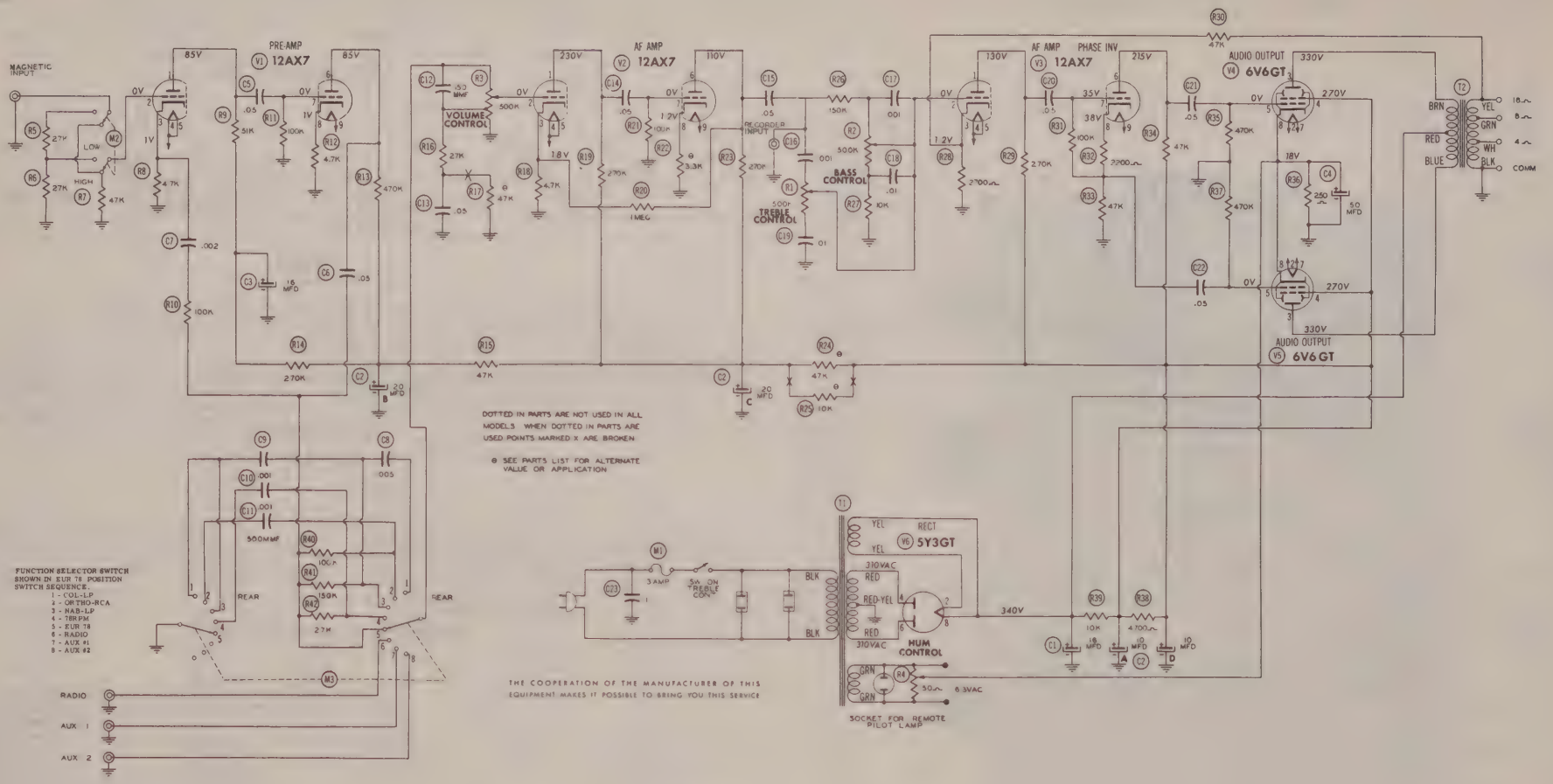
MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M2 M3	Switch		Hi-Lo Input Selector

CHASSIS—BOTTOM VIEW



MASCO MODEL CM-10



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†400KΩ	47KΩ	4.7KΩ	262Ω	262Ω	†550KΩ	100KΩ	4.7KΩ	262Ω
V 2	12AX7	†300KΩ	0Ω	4.7KΩ	262Ω	262Ω	†300KΩ	100KΩ	3.3KΩ	262Ω
V 3	12AX7	†300KΩ	10KΩ	2.7KΩ	262Ω	262Ω	†60KΩ	150KΩ	50KΩ	262Ω
V 4	6V6GT	0Ω	262Ω	†140Ω	†10KΩ	470KΩ	0Ω	262Ω	250Ω	
V 5	6V6GT	0Ω	262Ω	†140Ω	†10KΩ	470KΩ	470KΩ	262Ω	250Ω	
V 6	5Y3GT	INF	150KΩ	INF	160Ω	INF	160Ω	INF	150KΩ	

† MEASURED FROM PIN 8 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

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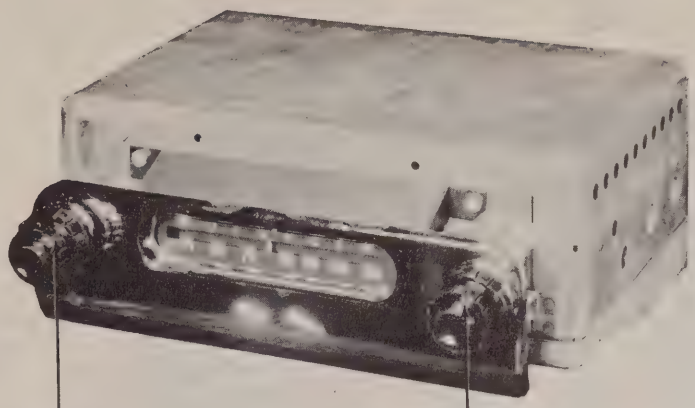

MOTOROLA
MODEL CTM 3

TRADE NAME	Motorola Model CTM3 (For 1953 Chevrolet Automobiles)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built Automobile AM Superheterodyne Receiver
TUBES (Six)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 4.2 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Set the dial pointer approximately 1/4" to the left of "55" on the dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400%Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	Thru dummy (Fig.1) to antenna receptacle	1605KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6, A7	"
	NOTE: Alignment of tuner cores is not recommended in the field unless cores have been replaced or tampered with. If tuner core alignment is necessary, continue alignment with step 4. Otherwise continue alignment with step 6.						
4.	Fig. 1	Thru dummy (Fig.1) to antenna receptacle	1610KC	High frequency end stop	Across voice coil	A5, A6, A7	Cores should project 1 1/32" from end of coil form. To adjust cores fabricate two alignment tools similar to Fig. 2. Grasp the core between the rubber covered ends of alignment tools and rotate cores to desired position. Adjust A5, A6 and A7 for maximum output.
5.	"	"	1400KC	Tune to 1400KC signal	"	A8, A9, A10	Adjust for maximum output.
6.	With radio installed in car and antenna fully extended tune in a weak station near 1400KC and adjust A7 for maximum volume.						

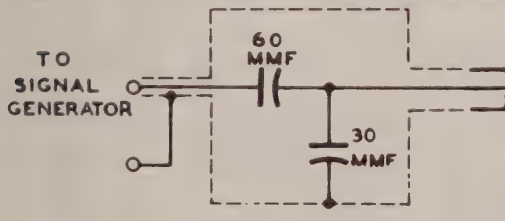

FIG. 1

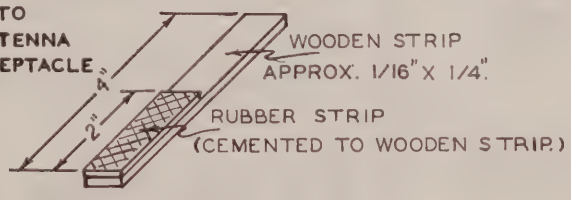

FIG. 2

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL CTM3

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7CK	
V4	Det-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■15	350	23A485677	AFH3-104		C077		FP328	TVL-3630	
B	▲10	350								
C	20	25								
C2	90		21A591682							
C3	.006	100	8A4529	P688-006	D6-602	CUB6D6	GP2-333-602	PT626	6TM-D6	
C4	5		21R115955	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-5547	5TCUB-V5	
C5	47		21R115593	SI47N750	TCN-47	TN14	N750K-470	NT-5447	5TCU-Q47	
C6	.05	400	8R14791	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C7	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C8	.01	100	8R472754	P288-01	D6-103	PJ2S1	GP2-333-103	PT411	2TM-S1	
C9	.01	400	8R23690	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C10	470		21R115850	SI470	D6-471	TP46	GP2L-471	UC-5347	5GA-T47	
C11	.004	400	8K71909	P488-004	D6-402	CUB4D4	GP2- 333-402	PT424	4TM-D4	
C12	.5	100	8K17028	VHC-36		PJ2P5		RF480	HC-3	
C13	.5	100	8K17028	VHC-36		PJ2P5		RF480	HC-3	
C14	.03	1000	8K400883	P1088-03		CUB10S3		PT1613	MB-S3	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	18A530094			AB-60	U-48	Volume
B	Shaft		Not Req.			AK-8	DS-37	Attach to R1A
C	Switch		Not Req.			KB-1	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R2	1 Meg	½	6R6004	BTS-1 Meg	
R3	220Ω	½	6R6270	BTS-220	
R4	100KΩ	½	6R6075	BTS-100K	
R5	47KΩ	½	6R6056	BTS-47K	
R6	330Ω	½	6R6022	BTS-330	
R7	6800Ω	2	6R5690	BTB-6800	
R8	4. 7Meg	½	6R2122	BTS-4. 7Meg	

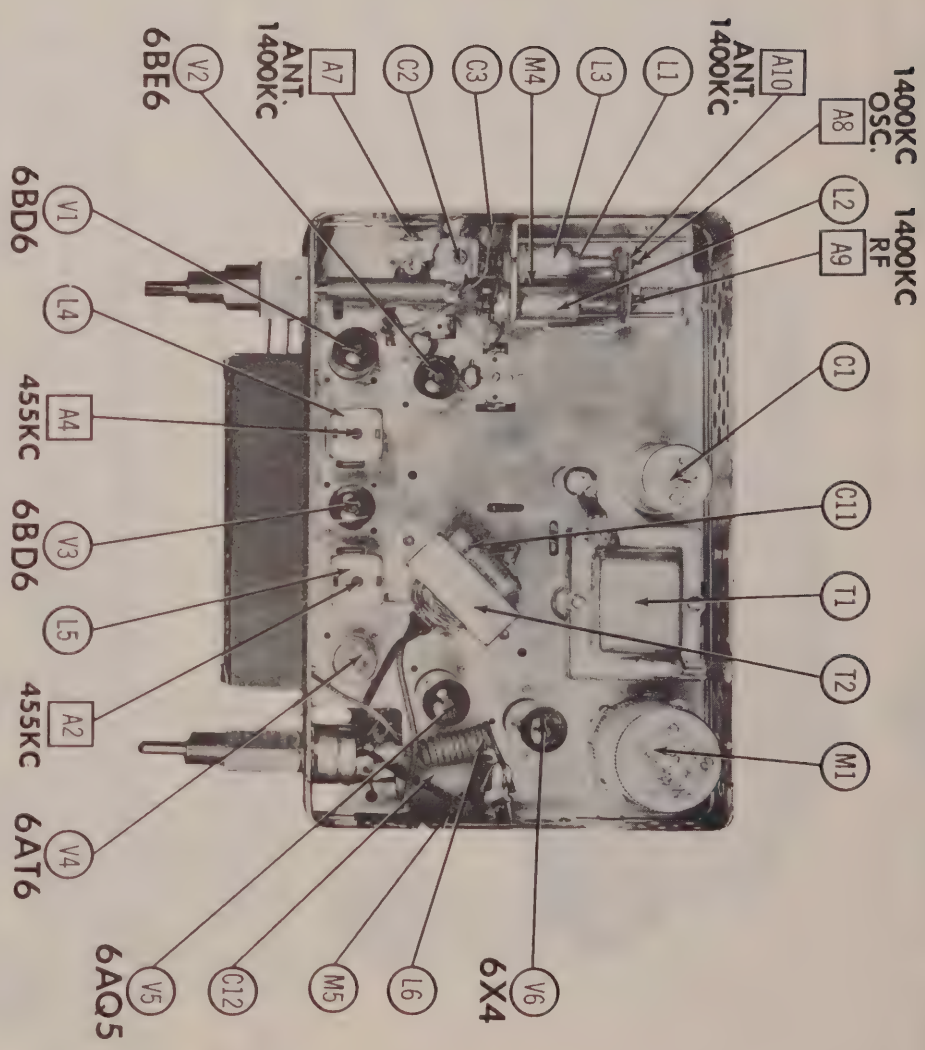
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	NOTES
R9	470KΩ	½	6R6032	BTS-470K	
R10	270KΩ	½	6R6414	BTS-270K	
R11	270Ω	1	6R6336	BTA-270	
R12	2200Ω	2	6R5687	BTB-2200	
R13	56Ω	½	6R5614	BTS-56	
R14	56Ω	½	6R5614	BTS-56	
R15	1 Meg	½	6R6004	BTS-1 Meg	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6. 3VCT @ 2. 3A	420VCT .042ADC			25C501303		P-3068	V-16K ①		

① Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	5.2KΩ	3.2Ω	25B70171	A-3877	A-2930	S-3X	Z1004	24S51	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"x 9"	PM	3.6Ω	50C513200 50C513193 ① 50C513195 ① 50C513197 ① 50C513544 ①	ST-810 Mod. P69-V	69A2	① Alternate 6"x 9" PM speakers.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	12Ω		24B502472				Part of tuner
L2	RF Coil	12Ω		24B502473				Part of tuner
L3	Osc. Coil	.6Ω	2.6Ω	24B502474				Part of tuner
L4	Input IF	17Ω	17Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	17Ω	17Ω	24C485554	16-6770	BC-355	12-C6	
L6	Fil. Choke	0Ω		24K580706				
L7	Vibrator Hash Choke	0Ω		24A472535		BC-537	5221	2 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interrupter	6.3V	115∿	48B3333	5342	859	5342	

FUSES

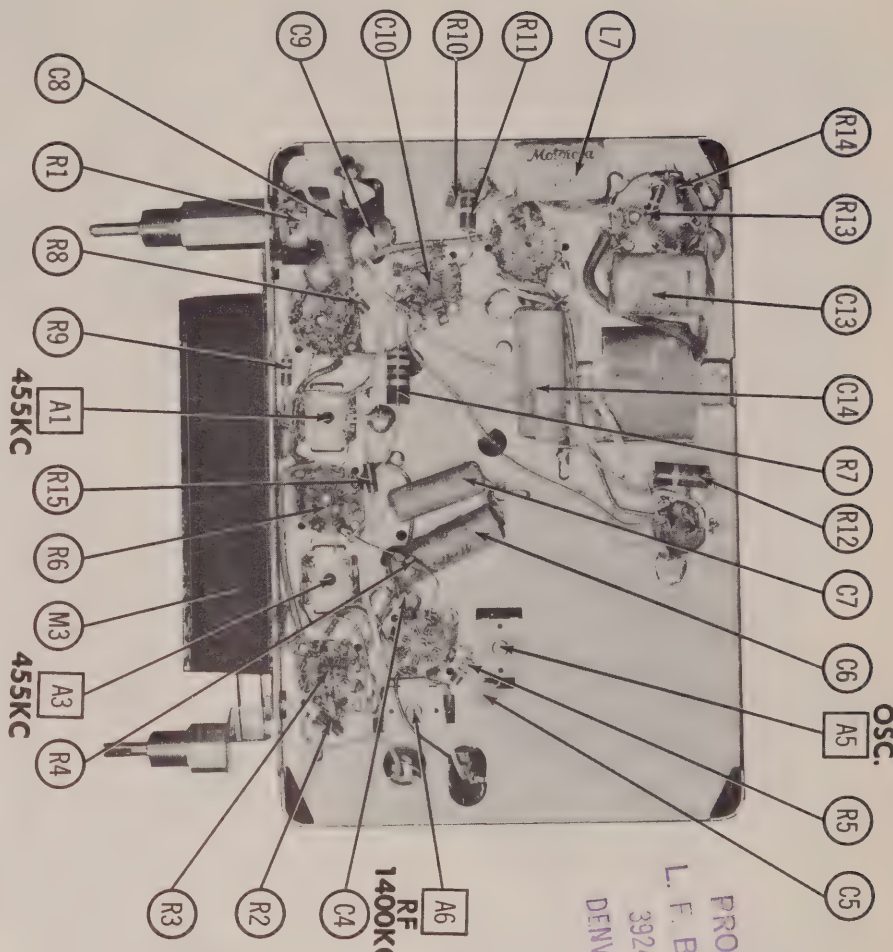
ITEM No.	TYPE	RATING	REPLACEMENT DATA MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	SFE	9A	65K16248	9K530099 *	307009 (SFE-9A)	155009	SFE-9A	HRH *

* Includes fuse.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X10867	Bayonet #44
M4	Tuner	51D502490	Permeability, complete
M5	Spark Plate	1V530167	
A7	Trimmer Cap.	20A502338	Ant. (50-280MMF)
A6	Trimmer Cap.	20A481526	RF (20-180MMF)
A5	Trimmer Cap.	20A485708	Osc. (395-470MMF)
	Knob	1V530175	Tuning & volume
	Knob	36B530118	Dummy, tuning & volume
	Dial Scale	34B530121	

CHASSIS—BOTTOM VIEW



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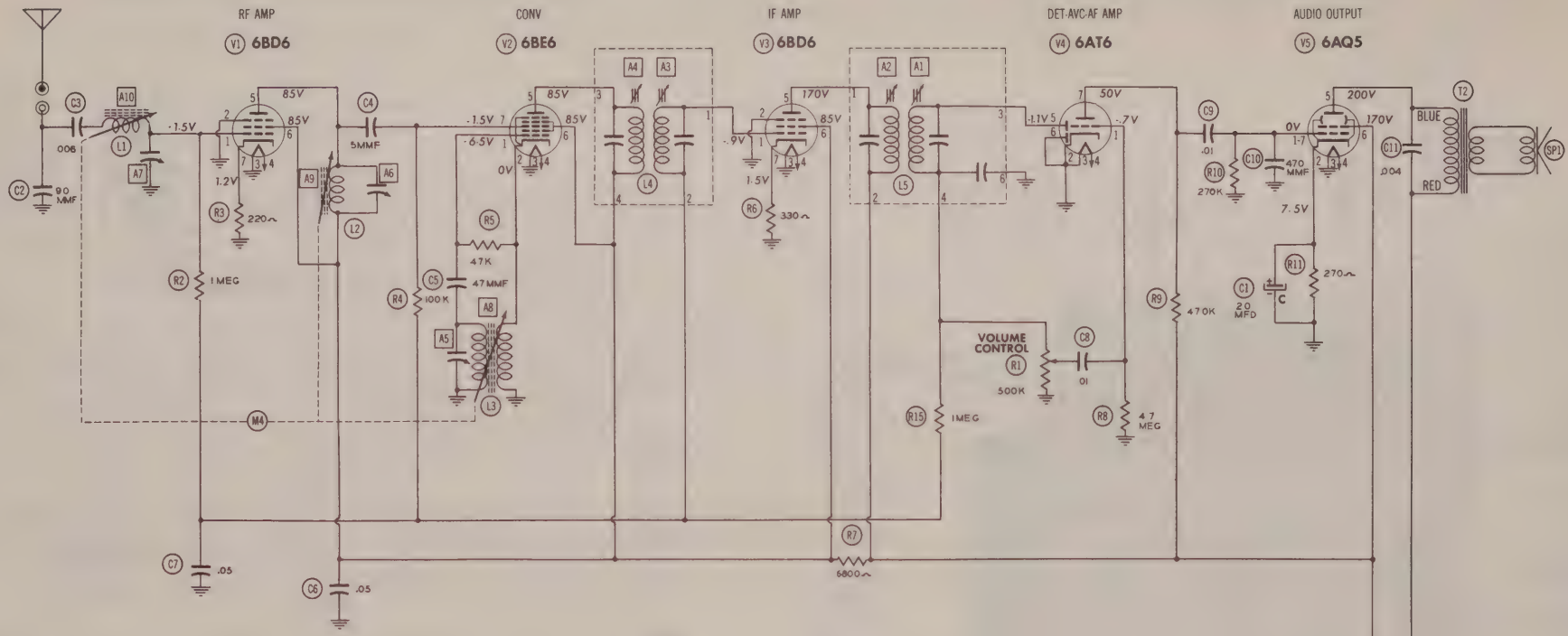
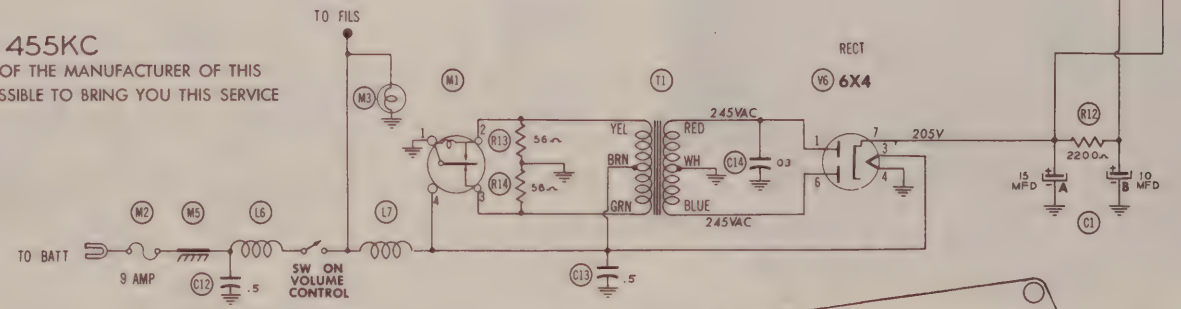
DENVER, COLORADO

MOTOROLA MODEL CTM3





IF = 455KC

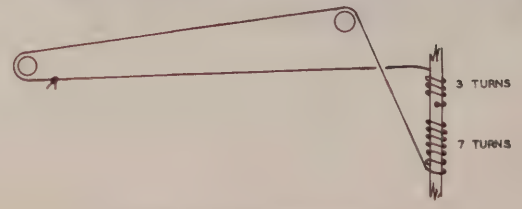
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	2.5Meg	0Ω	0Ω	.4Ω	†9KΩ	†9KΩ	330Ω
V 2	6BE6	47KΩ	.6Ω	0Ω	.4Ω	†9KΩ	†9KΩ	1.6Meg
V 3	6BD6	1.5Meg	0Ω	0Ω	.4Ω	†2.2KΩ	†9KΩ	330Ω
V 4	6AT6	4.7Meg	0Ω	0Ω	.4Ω	500KΩ	0Ω	†472KΩ
V 5	6AQ5	270KΩ	270Ω	0Ω	.4Ω	†484Ω	†2.2KΩ	270KΩ
V 6	6X4	428Ω	.4Ω	.4Ω	0Ω	INF	384Ω	900KΩ

† MEASURED FROM PIN 7 OF V6



DRIVE CORD STRINGING

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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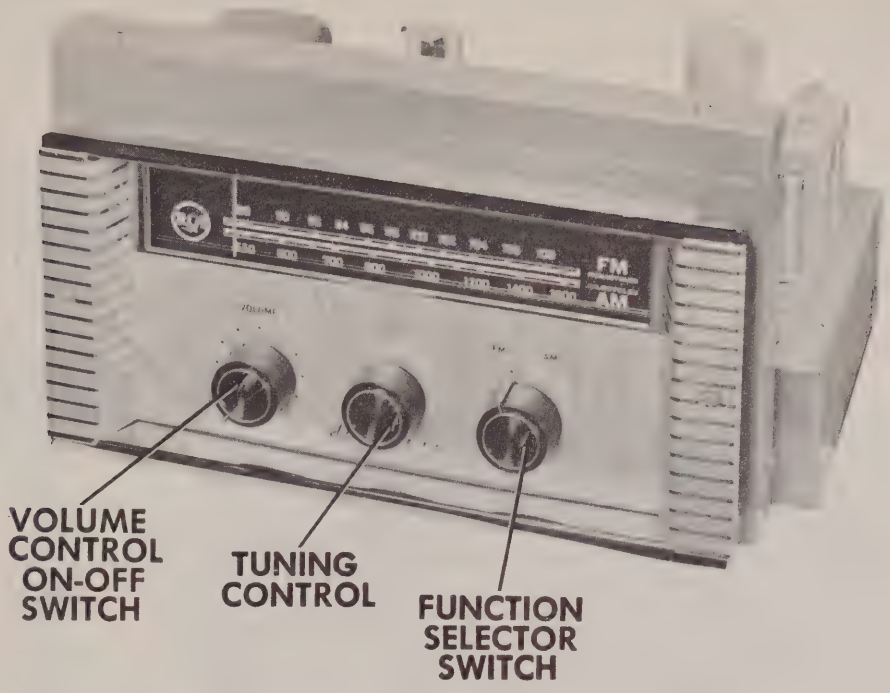
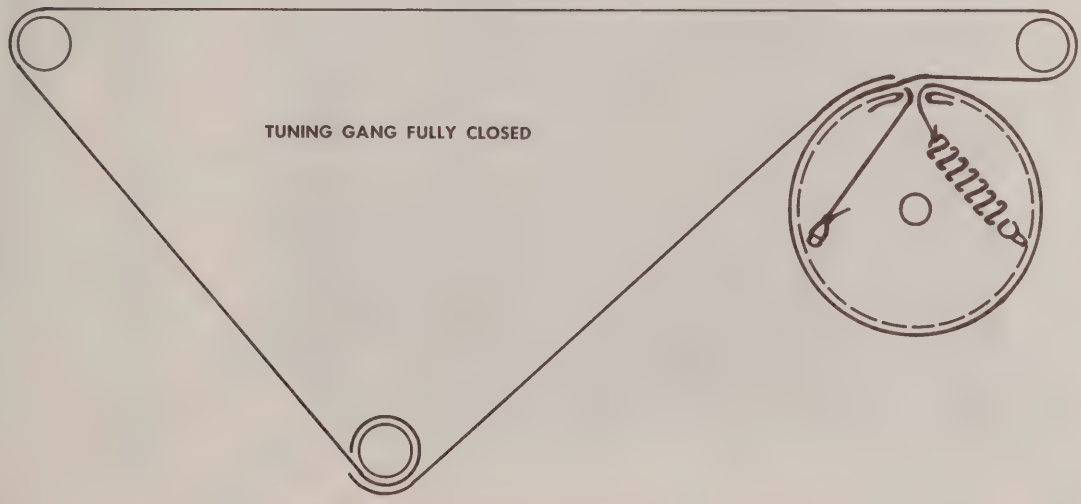
[illegible]

RCA VICTOR
MODEL ST-1 (MI-12107)



TRADE NAME	RCA Victor Model ST-1 (MI-12107)	
MANUFACTURER	RCA Victor, Eng. Products Dept., Radio Corp. of America, Camden, N.J.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner for Custom Installation	
TUBES	Eleven	
POWER SUPPLY	105-125 Volts AC-50/60 Cycles	RATING .43 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	535-1620KC	FREQ. MOD. 88-108MC

RCA VICTOR
MODEL ST-1 (MI-12107)



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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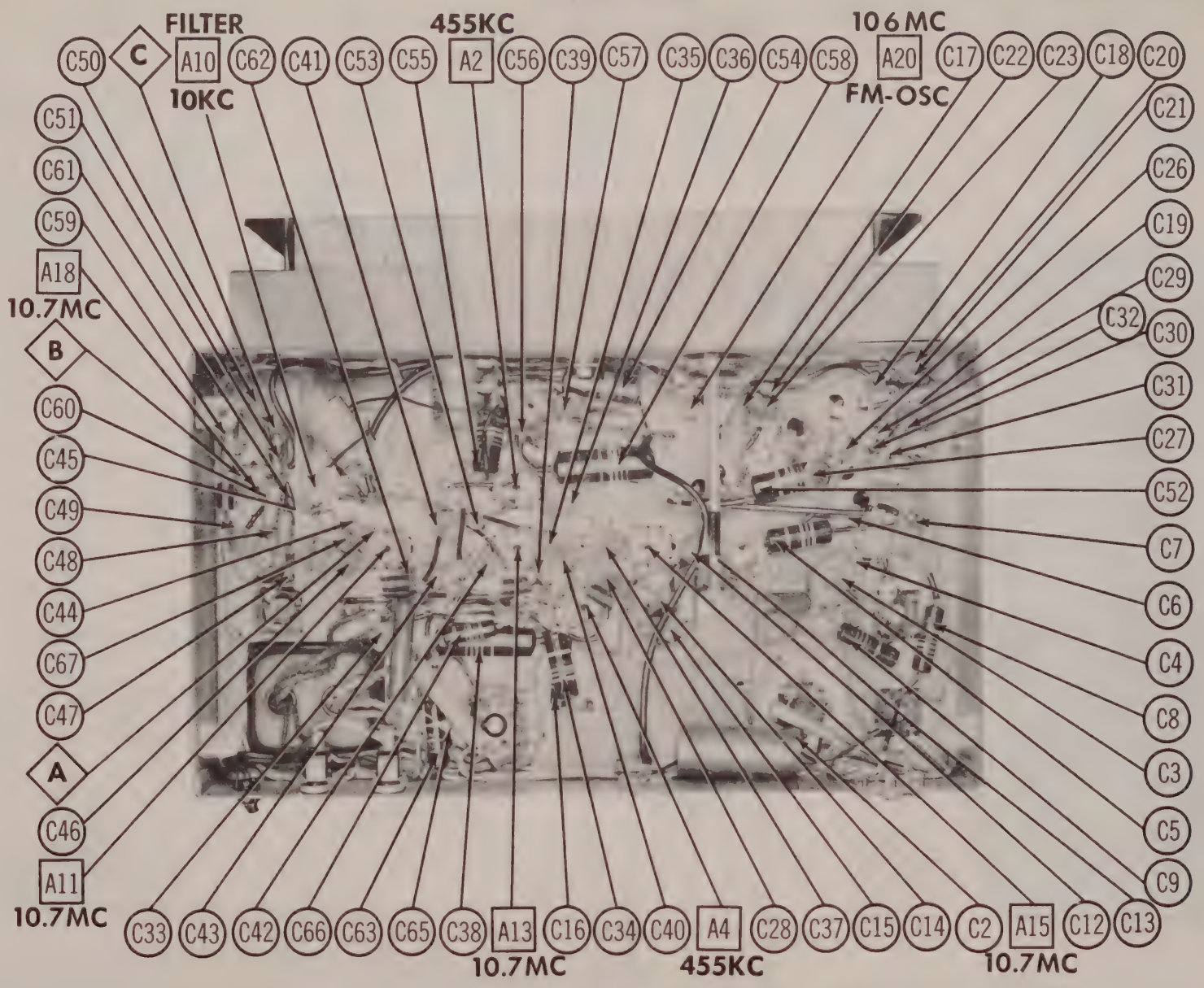
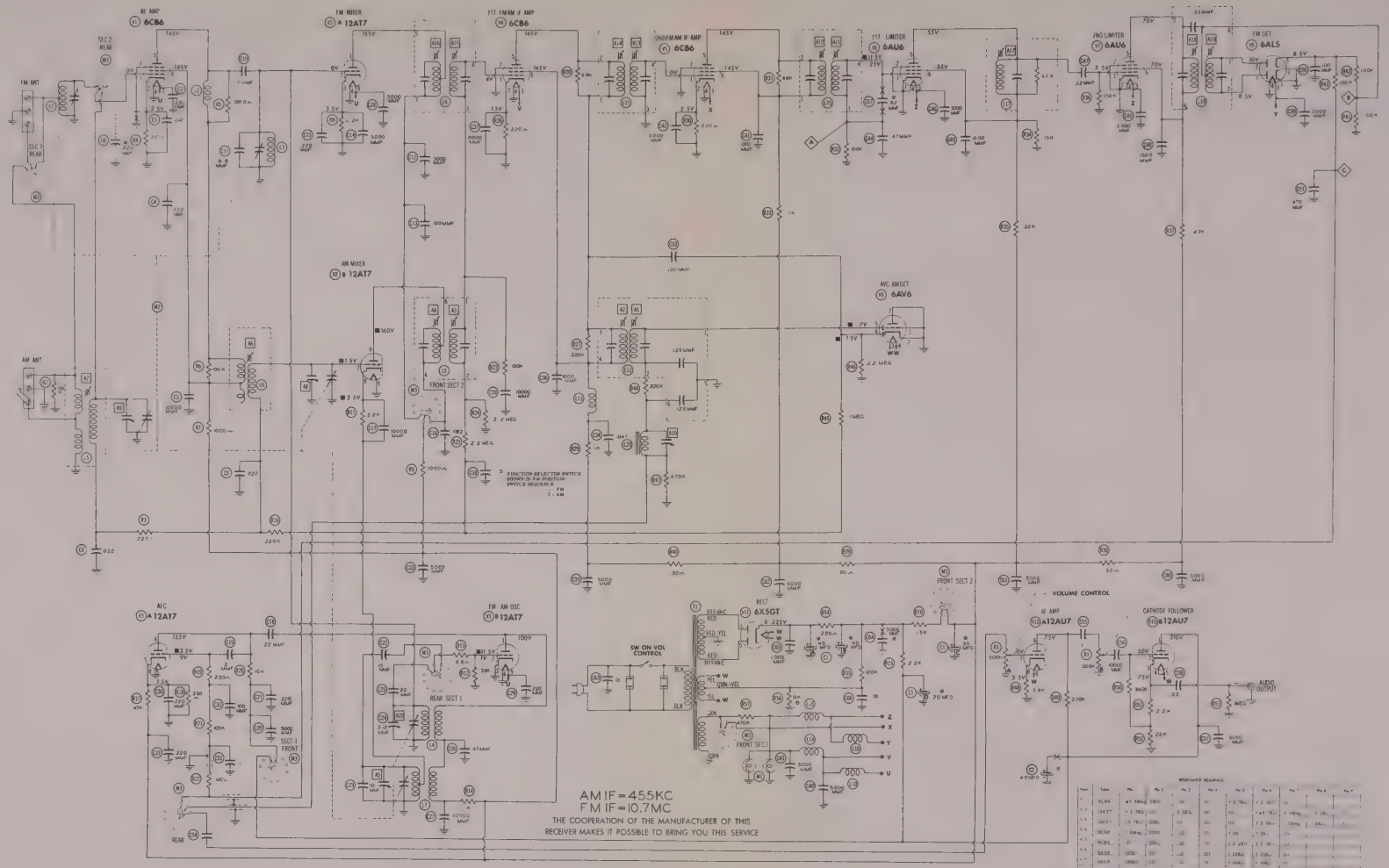


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


RF AMP V1 6CB6
FM MIXER V2 A 12AT7
1ST FM/AM IF AMP V4 6CB6
2ND FM/AM IF AMP V5 6CB6
1ST LIMITER V6 6AU6
2ND LIMITER V7 6AU6
FM DET V8 6AL5
FM ANT
AM ANT
AM MIXER V7 B 12AT7
AVC AM DET V9 6AV6
AFC V7 A 12AT7
FM AM OSC V3 B 12AT7
RECT V11 6X5GT
AF AMP V10 A 12AU7
CATHODE FOLLOWER V10 B 12AU7
SW ON VOL CONTROL
VOLUME CONTROL
AUDIO OUTPUT
FRONT SECT 2
REAR SECT 1
FRONT SECT 1
REAR
AM IF = 455KC
FM IF = 10.7MC
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
RESISTANCE READINGS
ALL READINGS ARE IN FM POSITION UNLESS OTHERWISE INDICATED
* MEASURED IN AM POSITION
† MEASURED FROM PIN 8 OF V11

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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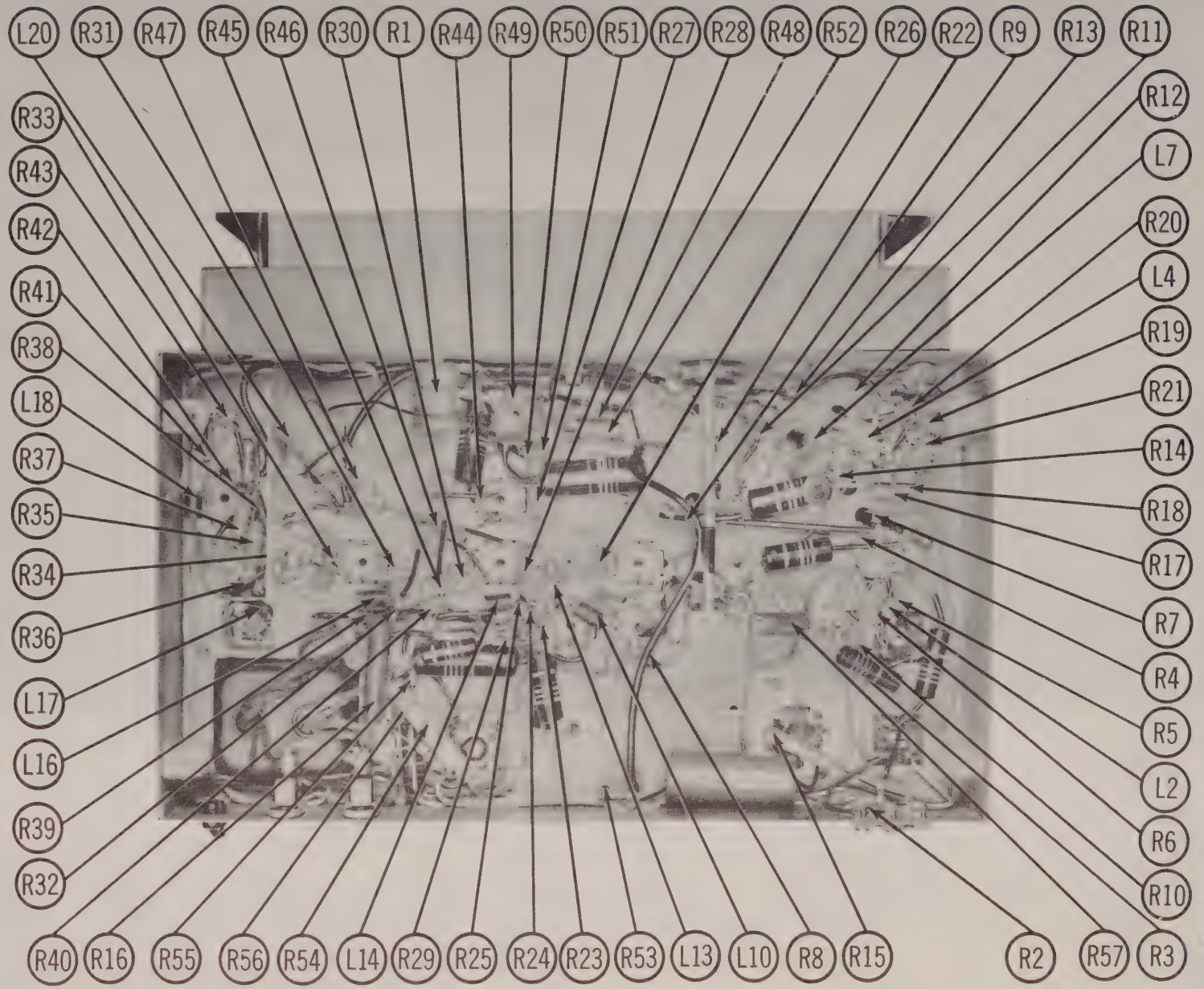
255 – 10



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
2004 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	455KC (400∿Mod)	AM	Point of non-interference	Across audio output (rear panel)	A1, A2, A3, A4	Adjust for maximum output.
2.	220MMF	High side thru 200MMF to AM antenna terminal. Low side to chassis.	1500KC	"	1500KC	"	A5	"
3.	"	"	600KC	"	Tune to 600KC signal	"	A6, A7	"
4.	"	"	1400KC	"	Tune to 1400KC signal	"	A8, A9	Adjust for maximum output. Repeat steps 3 and 4.
5.	"	"	1400KC (10KC Mod)	"	"	"	A10	Adjust for MINIMUM output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A11, A12, A13, A14 A15, A16	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe thru 1Meg to point Ⓑ. Common to chassis.	A17, A18	"
8.	"	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A11, A12 A13, A14 A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A17, A18	"
8.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A19	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	270Ω Carbon Resistor	High side thru 270Ω to FM antenna terminal. Low side to chassis.	106MC (Use 400∿ FM Mod. with 50KC Swp)	FM	106MC	Across audio output (rear panel)	A20	Adjust for maximum deflection.
10.	"	"	90MC (Use 400∿ FM Mod. with 50KC Swp)	"	Tune to 90MC signal	"	L1, L3	Adjust for maximum deflection by compressing or expanding coil turns.
11.	"	"	98MC (450KC Swp)	"	98MC	Use Scope. Vert. Amp. to point Ⓒ. Low side to chassis.		Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection. Check for response similar to Fig. 2. If necessary, repeat steps 9 and 10.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: RCA Victor PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6CB6	6CB6	7CM	
V2	FM AM Mixer	12AT7	12AT7	9A	
V3	FM AM Oscillator AFC	12AT7	12AT7	9A	
V4	1st FM AM IF Amp.	6CB6	6CB6	7CM	
V5	2nd FM AM IF Amp.	6CB6	6CB6	7CM	
V6	1st Limiter	6AU6	6AU6	7BK	
V7	2nd Limiter	6AU6	6AU6	7BK	
V8	FM Detector	6AL5	6AL5	6BT	
V9	AVC AM Detector	6AV6	6AV6	7BT	
V10	AF Amplifier-Cathode Follower	12AU7	12AU7	9A	
V11	Rectifier	6X5GT	6X5GT	6S	

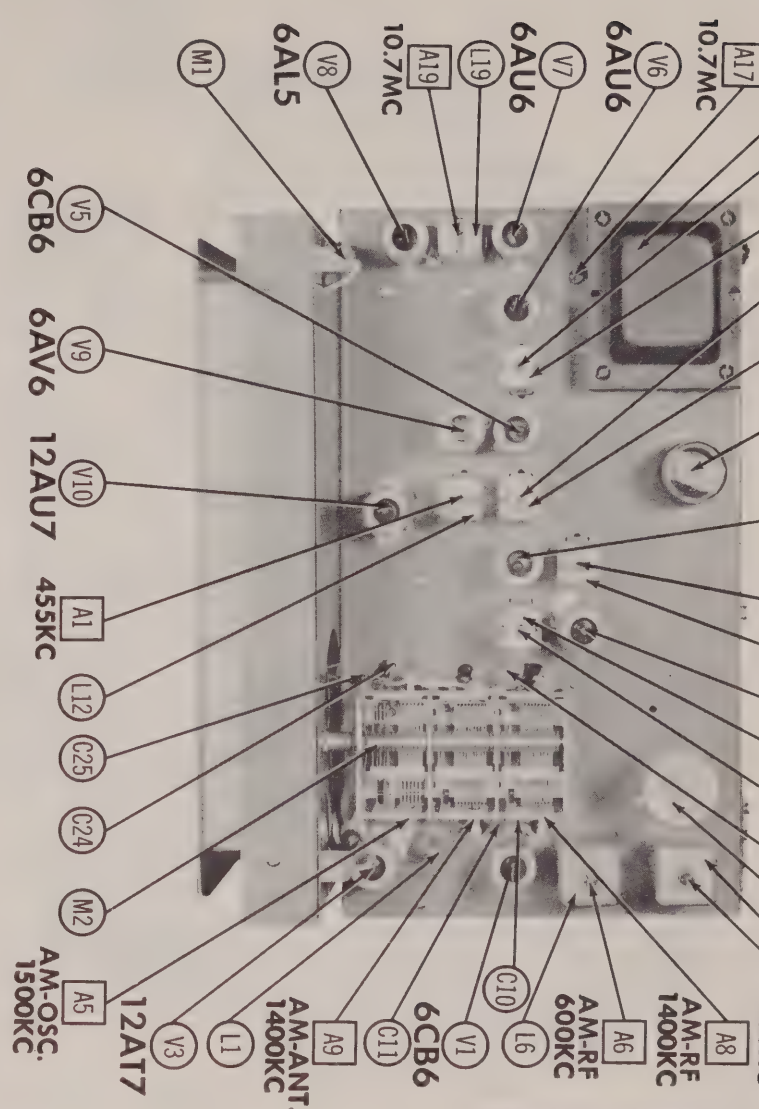
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	300		AFH3-42		D092		FP428.4	TVL-3728	Note 1
B	■40	300		PRS450/40					TVA-1611	
C	▲30	300								
D	20	300								
C2	40	250		PRS250/40		BR4025		TC58	TVA-1511	Note 2
C3	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C4	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C5	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C6	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C7	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C8	.022	400		P488-022		CUB4S22		PT4122	4TM-S22	
C9	.022	400		P488-022		CUB4S22		PT4122	4TM-S22	
C10	10			SI10	D6-100	TP08	GP1K-100	UC-541	5GA-Q1	
C11	6.8			SI6.8NP0	TCZ-6.8	TZ08	NP0K-6R8	ZT-5568	5TCCB-V68	
C12	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C13	100			BPD-0001	DD-101	G042	GP1K-101	DC-531	5GA-T1	
C14	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C15	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C16	.022	400		P488-022		CUB4S22		PT4122	4TM-S22	
C17	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C18	22			SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C19	2									
C20	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C21	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C22	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C23	10			SI10	D6-100	TP08	GP1K-100	UC-541	5GA-Q1	
C24	3-13									
C25	22			SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	
C26	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C27	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C28	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C29	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C30	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C31	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C32	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C33	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C34	.047	400		P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C35	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C36	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C37	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C38	.15	400		P488-.15		CUB4P15		PT4015	4TM-P15	
C39	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C40	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C41	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C43	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C44	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C45	1500			BPD-0015	DD-152	K071	812-0015	DC-5215	5GA-D15	
C46	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	22			SI22	D6-220	TP22	GP1K-220	UC-5422	5GA-Q22	

(CONT'D ON NEXT PAGE)

CHASSIS—TOP VIEW



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DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C48	1500			BPD-0015	DD-152	K071	812-0015	DC-5215	5GA-D15	
C49	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C50	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C51	470			SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C52	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C53	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C54	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C55	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C56	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C57	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C58	.22	200		P288-22		PJ2P22		PT4022	2TM-P22	
C59	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C60	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C61	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C62	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C63	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C64	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	Note 2
C65	1000			BPD-001	DD-102	K069	811-001	DC-521	5HK-D1	
C66	.01	400		P488-01	DD-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C67	62			SI62NP0	TCZ-62		NP0K-620			Note 2

Note 1. Some models use a 40-40-20-20MFD @ 300V in this application.
Note 2. Not used in all Models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A727S32	Q13-133			UF55A	} Volume
B	500KΩ	½		M13-133			UR55A	
C	Switch			76-1			US-26	Attach to R1B

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R2	100KΩ	½		BTS-100K	
R3	220KΩ	½		BTS-220K	
R4	330Ω	½		BTS-330	
R5	1500Ω	½		BTS-1500	
R6	100KΩ	½		BTS-100K	
R7	1000Ω	½		BTS-1000	
R8	2200Ω	½		BTS-2200	
R9	1000Ω	½		BTS-1000	
R10	220KΩ	½		BTS-220K	
R11	2200Ω	½		BTS-2200	
R12	33KΩ	½		BTS-33K	
R13	6.8Ω	1½			
R14	1000Ω	1½		BTS-1000	
R15	2200Ω	2		BTB-2200	
R16	1500Ω	10			
R17	47KΩ	1		BTA-47K	
R18	330Ω	½		BTS-330	
R19	220Ω	½		BTS-220	
R20	10KΩ	1		BTA-10K	
R21	100KΩ	½		BTS-100K	
R22	1 Meg	½		BTS-1 Meg	
R23	100KΩ	½		BTS-100K	
R24	2.2Meg	½		BTS-2.2Meg	
R25	2.2Meg	½		BTS-2.2Meg	
R26	220Ω	½		BTS-220	
R27	220KΩ	½		BTS-220K	
R28	68KΩ	1½		BTS-68K	
R29	1000Ω	1½		BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	IRC PART No.	NOTES
R30	220Ω	½		BTS-220	
R31	68KΩ	½		BTS-68K	
R32	1000Ω	½		BTS-1000	
R33	100KΩ	½		BTS-100K	
R34	15KΩ	½		BTS-15K	
R35	22KΩ	1		BTA-22K	
R36	150KΩ	½		BTS-150K	
R37	47KΩ	½		BTS-47K	
R38	150Ω	½		BTS-150	
R39	150Ω	½		BTS-150	
R40	150Ω	½		BTS-150	
R41	100KΩ	½		BTS-100K	
R42	100KΩ	½		BTS-100K	
R43	150KΩ	½		BTS-150K	
R44	220KΩ	½		BTS-220K	
R45	1 Meg	½		BTS-1 Meg	
R46	2.2 Meg	½		BTS-2.2Meg	
R47	470KΩ	½		BTS-470K	
R48	5600Ω	1		BTA-5600	
R49	220KΩ	1		BTA-220K	
R50	560KΩ	½		BTS-560K	
R51	2200Ω	½		BTS-2200	
R52	22KΩ	1		BTA-22K	
R53	1 Meg	½		BTS-1 Meg	
R54	220Ω	2			
R55	100KΩ	½		BTS-100K	
R56	15KΩ	½		BTS-15K	Note
R57	470KΩ	5			

Note - Some models may use a 10KΩ resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .43A	410VCT .056ADC	6.3VCT @ 1.12A	6.3VAC @ 2.65A	19S208A					

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω (tapped)						
L2	FM RF Choke	3Ω			19-1003		4608	3.3 Microhenries; IRC Part # CLA
L3	FM RF Coil	0Ω						
L4	FM Osc. Coil	0Ω	0Ω					
L5	AM Ant. Coil	30Ω	5Ω	5A220C				Primary tapped @ 0Ω
L6	AM RF Coil	100Ω	5.5Ω	5A219A	14-7558 ■	BC-385 ■	73-RF ■	
L7	AM Osc. Coil	1.4Ω	6Ω		14-1060 *	BC-381 *	70-Osc.	Sec. tapped @ .8Ω
L8	1st FM IF	1ΩCT	.8Ω	5X013				
L9	1st AM IF	18ΩCT	18Ω	5X015				
L10	Fil. Choke	0Ω			19-3001	TV-189	6175	.6 Microhenry
L11	2nd FM IF	1Ω	1Ω	5X014	16-3487	FM-254	1463	
L12	2nd AM IF	18Ω	18Ω	5X016	16-6770	BC-355	12-C6	
L13	RF Choke	3Ω			19-1003		4608	3.3 Microhenries; IRC Part # CLA
L14	Fil. Choke	0Ω			19-3001	TV-189	6175	.6 Microhenry
L15	3rd FM IF	1Ω	1Ω	5X014	16-3487	FM-254	1463	
L16	Fil. Choke	0Ω			19-3001	TV-189	6175	.6 Microhenry
L17	4th FM IF	4Ω		5A017				Includes 4.7KΩ res. & 22MMF capacitor
L18	Fil. Choke	0Ω			19-3001	TV-189	6175	.6 Microhenry
L19	FM Discrim.	7Ω	1.1ΩCT	5X005	17-3484 †	FM-253	1464	

† Drill mounting hole.
■ Drill one new mounting hole.
† Cut out 1½" x 7/8" chassis hole and drill mounting holes.

10KC FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L20		1750Ω	2.4HY	19S406					

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Dial light		# 44 bayonet (2 used)
M2	Tuning cap.	175007	(30-425MMF, 43-455MMF, 25-195MMF)
M3	Switch		AM-FM selector
A10	Trimmer cap	17X205	10-160MMF-10KC filter

PROPERTY OF
L. F. BLANKENSHIP

RCA VICTOR
MODEL SVP-10 (MI-12198)

RCA VICTOR
MODEL SVP-10 (MI-12198)

TRADE NAME	RCA Victor Model SVP-10 (MI-12198)
MANUFACTURER	RCA Victor, Eng. Products Dept., Radio Corp. of America, Camden, N.J.
TYPE SET	AC Operated 5 Channel 10 Watt Audio Amplifier
TUBES (Six)	Types 6SC7 Pre-Amp., 6SF5 AF Amp., 6SL7GT AF Amp.-Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .6 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL SVP-10 (M1-12198)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT		
V1	Pre Amplifier	6SC7	6SC7	8S	
V2	AF Amplifier	6SF5	6SF5	6AB	
V3	AF Amplifier-Phase Inverter	6SL7GT	6SL7GT	8BD	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

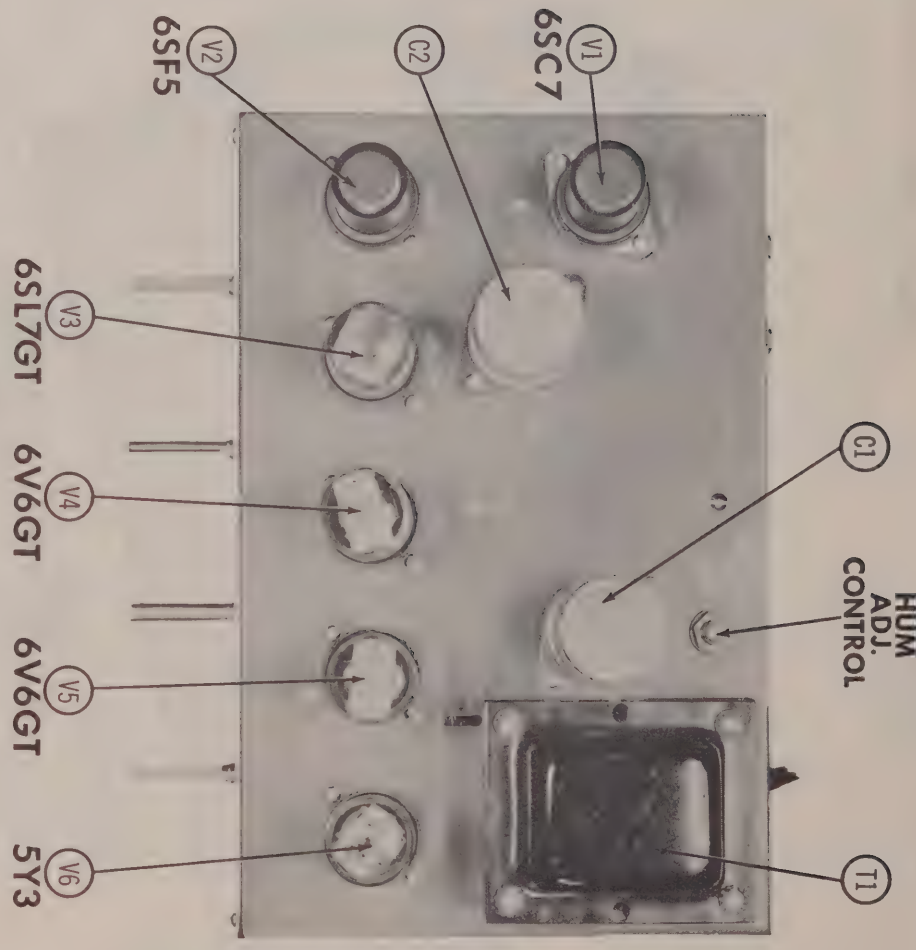
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲10	450		AFH4-04		D008		WP433.6	R1508	
B	▲10	450								
C2A	▲5	450		AFH4-09		D008		WP433.6	R1424	
B	■5	450								
C	▲5	450								
D	5	450								
C3	50	50		PR850/50		BR505		TC39	TVA-1308	
C4	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C5	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	.01	600		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C7	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C8	.03	600		P688-03		CUB6S3		PT613	6TM-S3	
C9	1000	500		1467-001		1W5D1		MCB255	MS-31	
C10	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C11	350	500		1468-00035		5W5T36			1FM-335	Note 1
C12	2200	500		1468-0002		5W5T22		MCB237	1FM-32	
C13	2500	500		1468-00025		5W5T25		MCB240	1FM-325	
C14	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C15	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C16	100	500		1468-0001		5W5T1		MCB235	1FM-31	
C17	.001	600		P688-001	D6-102	CUB6D1	GP2-333-102	PT621	6TM-D1	
C18	.047	400		489ZX-047	DF-503	CUB4S47		PT4147	4TM-S47	

Note 1. Some models may use a 200MMF @ 500V in this application.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA Victor PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	V-328	Q11-133	A47-500K-S	B-59-S	U-50	Treble
B	Shaft		Not Req.	Not Req.	RS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A
R2A	1 Meg	½	V-327	Q13-137	A47-1 Meg-Z	B-70	U-53	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	V-326	Q13-133	A47-500K-Z	B-60	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4	15Ω	1						Hum adjustment-wire wound

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA RCA Victor PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R5	100KΩ	½		BTS-100K	
R6	47KΩ	½		BTS-47K	
R7	1 Meg	½		BTS-1 Meg	
R8	47KΩ	½		BTS-47K	
R9	100KΩ	½		BTS-100K	
R10	15KΩ	½		BTS-15K	
R11	1 Meg	½		BTS-1 Meg	
R12	68KΩ	½		BTS-68K	
R13	2200Ω	½		BTS-2200	
R14	100KΩ	½		BTS-100K	
R15	100KΩ	½		BTS-100K	Note 1
R16	220KΩ	½		BTS-220K	Note 2
R17	22KΩ	½		BTS-22K	
R18	2200Ω	½		BTS-2200	
R19	2200Ω	½		BTS-2200	
R20	220KΩ	½		BTS-220K	
R21	220KΩ	½		BTS-220K	
R22	33KΩ	½		BTS-33K	Note 3
R23	3300Ω	½		BTS-3300	Note 4
R24	10KΩ	½		BTS-10K	
R25	220KΩ	½		BTS-220K	
R26	47KΩ	2		BTB-47K	
R27	270Ω	2			
R28	220KΩ	½		BTS-220K	
R29	22KΩ	½		BTS-22K	
R30	2200Ω	2		BTB-2200	
R31	300Ω	10	R3017	B3/4A-300	

Note 1. Some models may use a 68KΩ resistor in this application.
Note 2. Some models may use a 150KΩ resistor in this application.
Note 3. Some models may use a 22KΩ resistor in this application.
Note 4. Some models may use a 1000Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.60A	680VCT .077ADC	5VAC @2A	6.3VAC @2.5A	T-362-1	PM-8409 ①	P-2952①	R-11B ①	P9311 ①	T-24R04①

① Tape 6.3V center-tap .

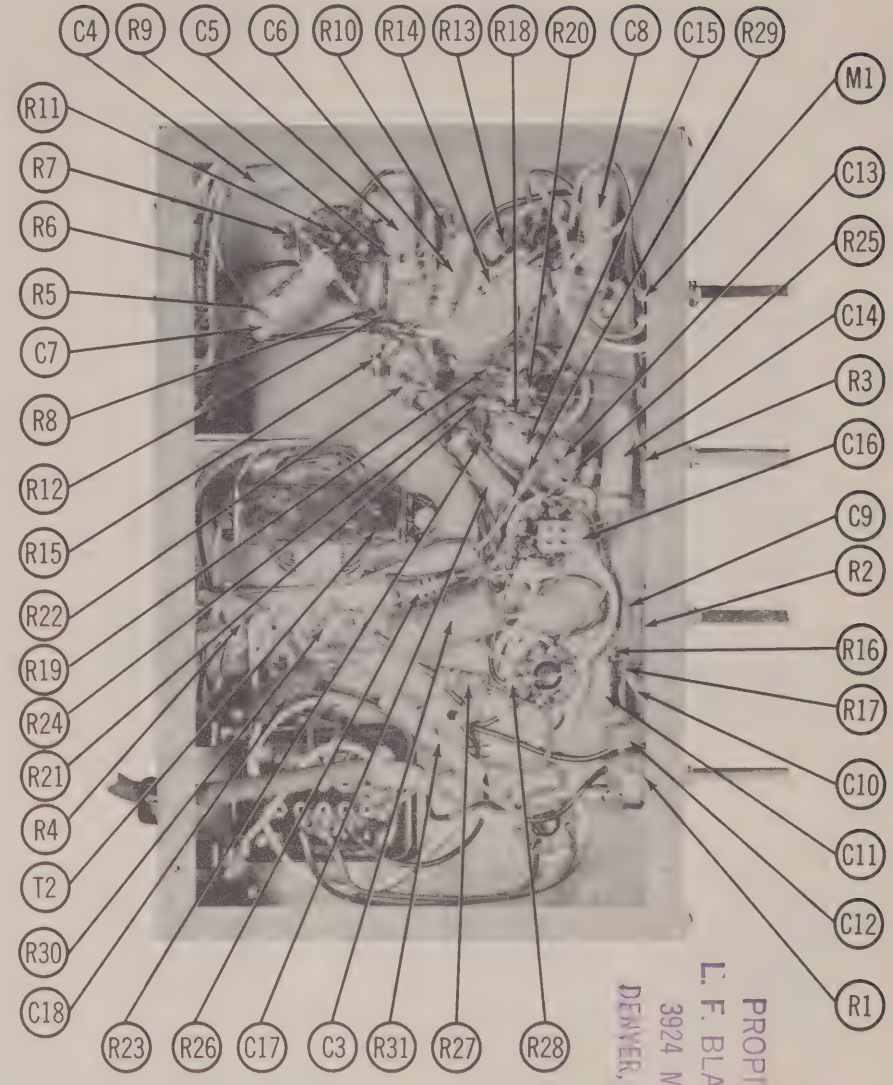
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	10KΩ CT	16Ω Tap @ 8Ω, 4Ω	T-292		A-3027		Z1404	22S44	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M1	Switch		Function

CHASSIS—BOTTOM VIEW



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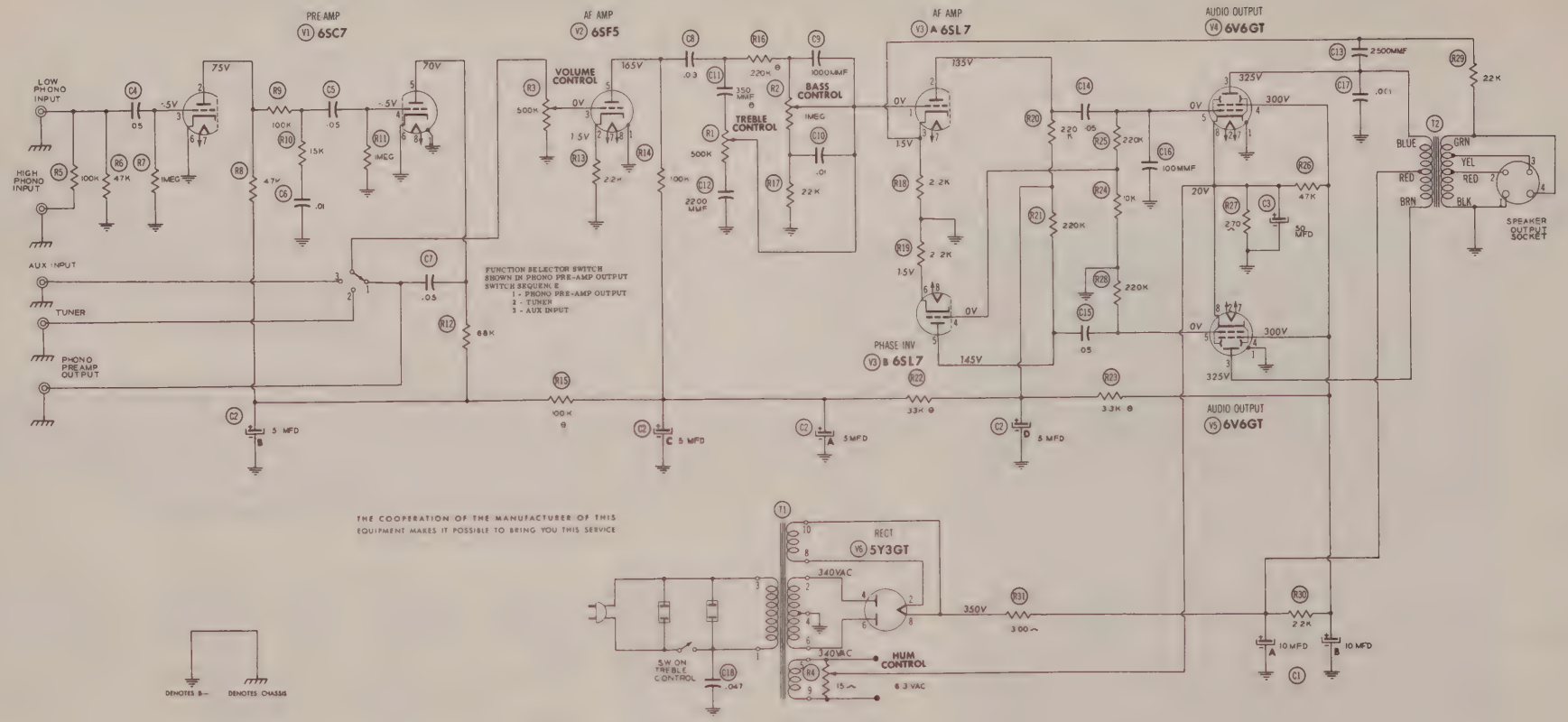
3924 MEADE ST.
DENVER, COLORADO

RCA VICTOR
MODEL SVP-10 (M1-12198)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	†185KΩ	1Meg	1Meg	†205KΩ	0Ω	270Ω	270Ω
V 2	6SF5	0Ω	2.2KΩ	500KΩ	INF	†140KΩ	INF	270Ω	270Ω
V 3	6SL7GT	1Meg	†225KΩ	2.2KΩ	10KΩ	†225KΩ	2.2KΩ	270Ω	270Ω
V 4	6V6GT	0Ω	270Ω	†510Ω	†2.5KΩ	230KΩ	220KΩ	270Ω	270Ω
V 5	6V6GT	0Ω	270Ω	†510Ω	†2.5KΩ	220KΩ	INF	270Ω	270Ω
V 6	5Y3GT	INF	50KΩ	INF	17Ω	INF	19Ω	INF	50KΩ

† MEASURED FROM PIN 2 OF V6

1 DC voltage measurements taken with vacuum tube voltmeter.
AC voltages measured at 1000 ohms per volt.
2 Socket connections are shown as bottom views.
3 Measured values are from socket pin to common negative.
4 Line voltage maintained at 117 volts for voltage readings.
5 Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6 All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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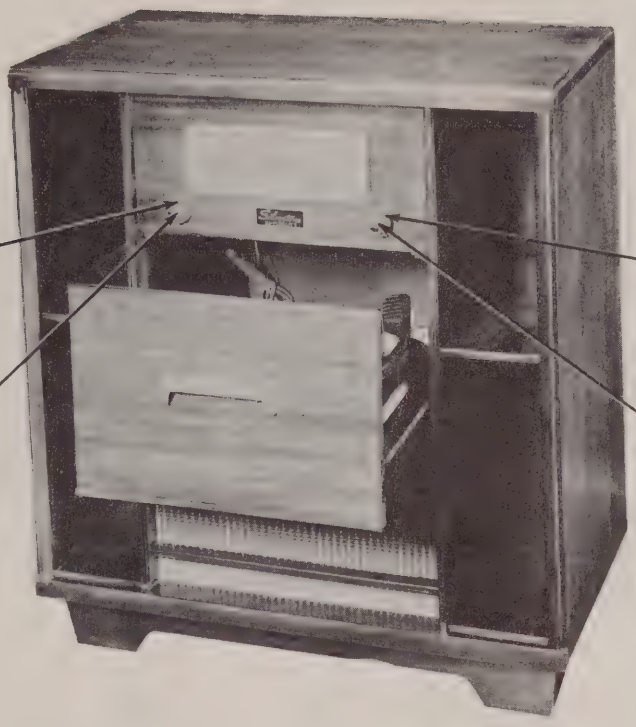
DENVER, [illegible]

SILVERTONE MODELS
4056, 4057 (Ch. 132.026-6)



SILVERTONE MODELS
4056, 4057 (Ch. 132.026-6)

TRADE NAME	Silvertone Models 4056, 4057 (Ch. 132.026-6)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan St., Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver with 3 Speed Automatic Record Changer
TUBES (Six)	Types 6BJ6 RF Amp., 6BE6 Conv., 6BJ6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .55 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Set tone control to treble position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to Pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output
2.	"	"	1650KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal	"		Bend RF and antenna slotted rotor plates on tuning gang for maximum output. Repeat Step 3.

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT 488.216-14, SEE SIMILAR V-M MODEL 950-PHOTOFACT SET # 216 FOLDER # 11 OR RECORD CHANGER MANUAL CM-5.

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PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 4056, (Ch. 132.026-6)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BJ6	6BJ6	7CM	
V4	Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6V6GT	6V6GT	7S	
V6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	20	450	N25803	AFH4-67		D052		FP444	TVL-4763	
B	20	450								
C	20	450								
D	20	25								
C2	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C3	.01	400								
C4	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C5	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C6	1.5									
C7	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C8	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C9	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C10	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C11	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C12	100	500		1468-0001		5W5T1		MCB235	MS-31	
C13	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C14	.0047	400		P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C15	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C16	220	500		1468-0002		5W5T22		MCB237	MS-32	
C17	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C18	.25	200		P288-25		PJ2P25		PT4025	2TM-P25	
C19	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C20	.001	600		P688-001	D6-102	CUB6D1	GP2-333-102	PT621	6TM-D1	
C21	2.0	200	N41878							
C22	.01	600		689ZX-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C23	.01	600		689ZX-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	40KΩ	½	N40724	* QJ-565R			UF-253L	Tone-Panel- Note
B	1 Meg	½					UR16T-254	Volume tapped at 250K-Rear
C	Switch						US-26	Attach to R1B

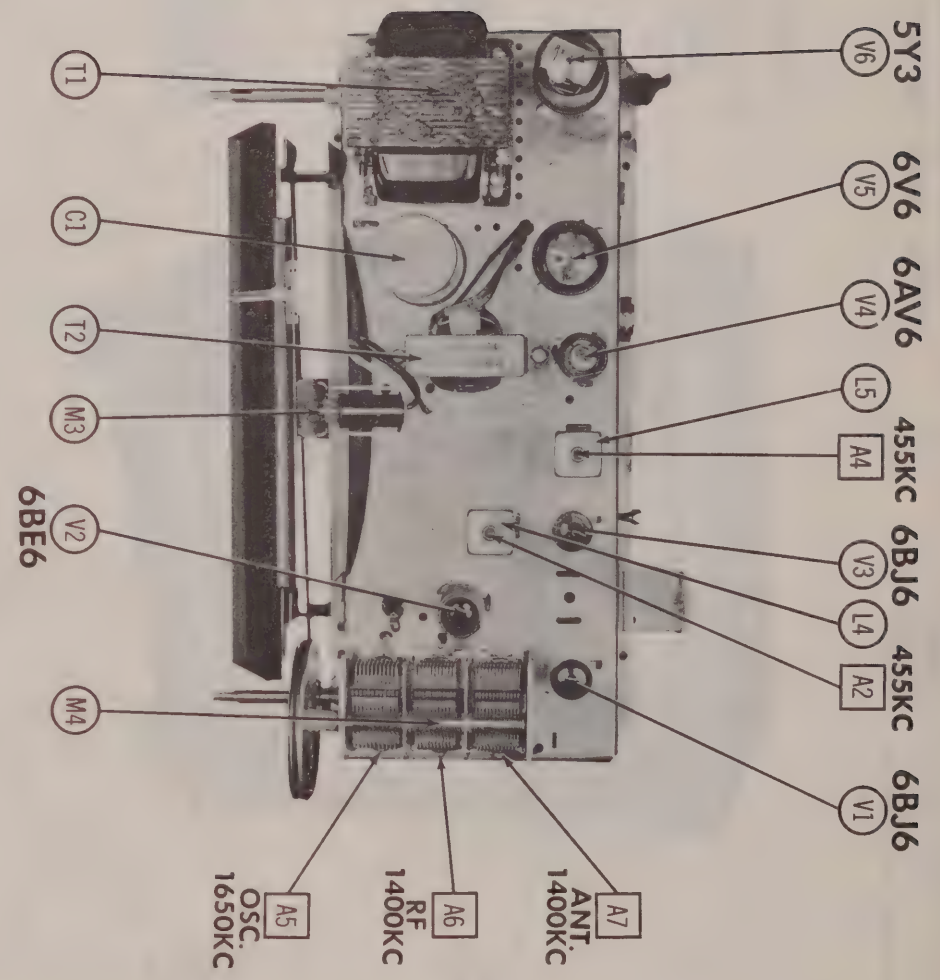
Note: Some models may use an alternate control Part No. N41858-IRC replacement for this control is QJ-564R
* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B11-128 & P1-200 (Panel)
B13-137X & R1-216 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	100KΩ	½		BTS-100K	
R3	330Ω	½		BTS-330	
R4	33KΩ	½		BTS-33K	
R5	330Ω	½		BTS-330	
R6	8200Ω	½		BTS-8200	
R7	2.2 Meg	½		BTS-2.2Meg	
R8	470Ω	½		BTS-470	
R9	18KΩ	1		BTA-18K	
R10	4700Ω	2		BTB-4700	
R11	47KΩ	½		BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R12	100KΩ	½		BTS-100K	
R13	560Ω	½		BTS-560	
R14	15 Meg	½		BTS-15 Meg	
R15	470KΩ	½		BTS-470K	
R16	470KΩ	½		BTS-470K	
R17	270Ω	1		BTA-270	
R18	3300Ω	½		BTS-3300	
R19	820Ω	1		BTA-820	
R20	750Ω	5			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ 55A	610VCT .063ADC	5VAC @ 2A	6.3VAC @ 1.5A	N-24440		P-3151	R-7A	P9302 ①	

① Tape unused lead.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	5.1KΩ	3.6Ω	N-24776-3	A-3849 ①	A-3019 ①	S-5X ①	Z1006	26S49	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	8"	PM	3.9Ω	N41877	ST-117 Mod. P8-T	8A21	
SP2	5"	PM	6.8Ω	N41876			

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Antenna	.1	2Ω	N40356				
L2	RF Coil	25Ω	8Ω	N25828-1	14-1071	BC-382	70-A	
L3	Osc. Coil	.5Ω	6Ω	N24482-1	14-1073		69-Osc.	
L4	Input IF	20Ω	20Ω	N21797-16	16-6758	BC-352	12-C1	
L5	Output IF	20Ω	20Ω	N21797-16	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	SILVERTONE PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1						47	O-2 or S-2	

ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

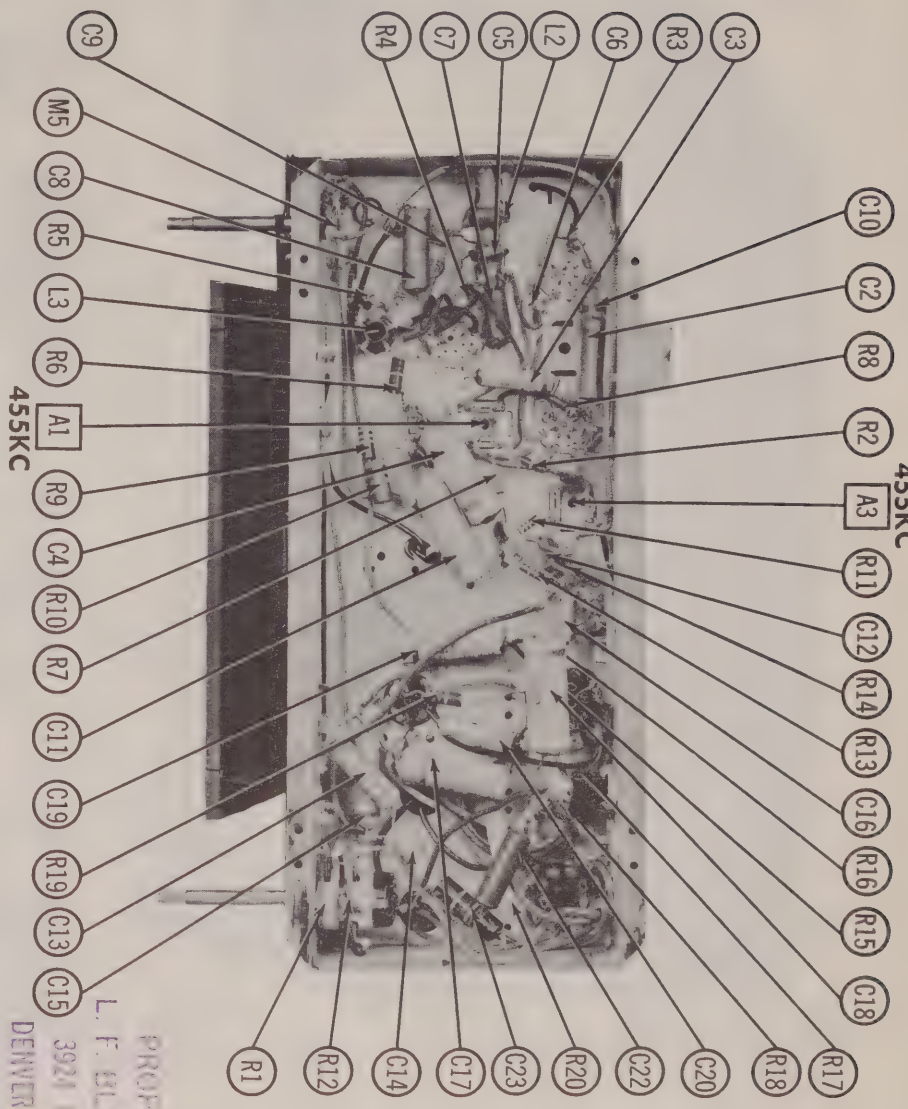
ITEM No.	REPLACEMENT DATA				REMARKS
	SILVERTONE PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		†S-66	† AC-434 ♦† AC-434D1 †♦ AC-434D2 ♦ AC-434D		† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Dial light	N19351	Bayonet # 47
M4	Tuning capacitor	N25802	25-427 MMF, 25-386MMF, 26-170MMF
M5	Switch	N25773	Phono-Radio
	Knob	N40800-3	Tone
	Knob	N40799-1	Volume & Radio-Phono
	Knob	N40800-1	Tuning
	Dial	N25827	Pointer

SET 255 FOLDER 12

CHASSIS—BOTTOM VIEW



PROPERTY OF
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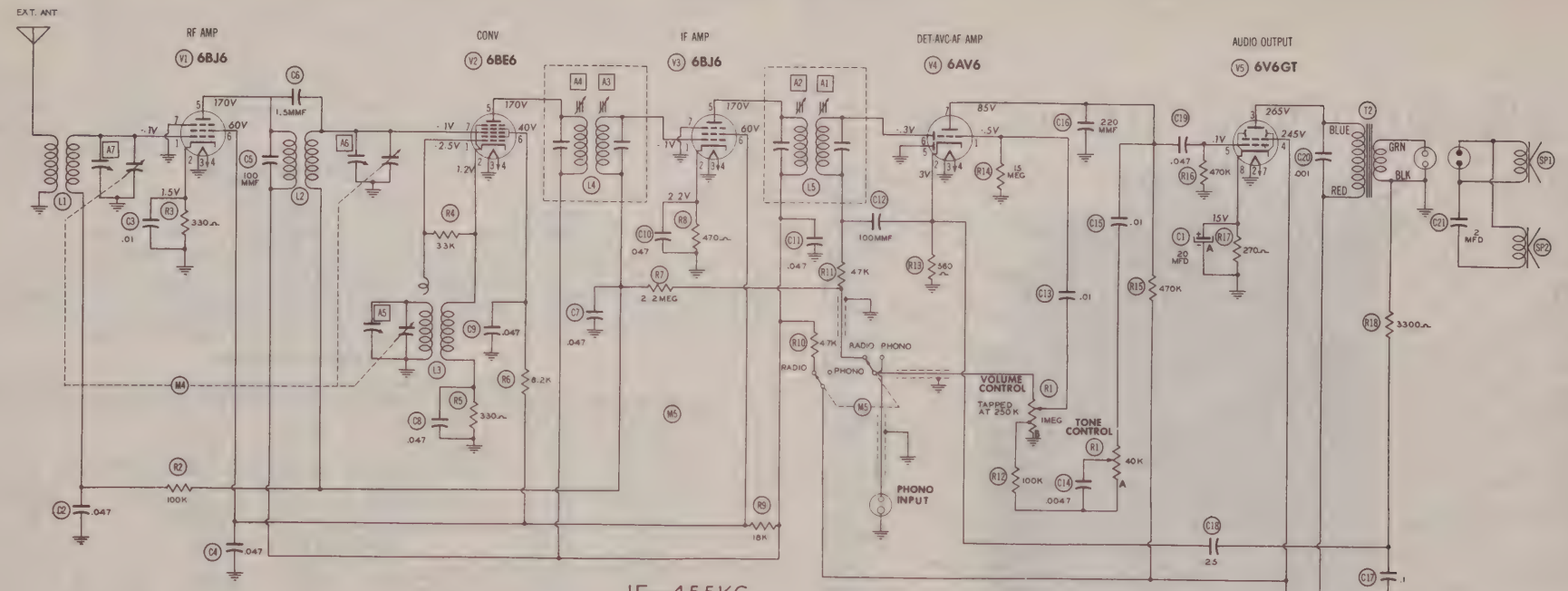
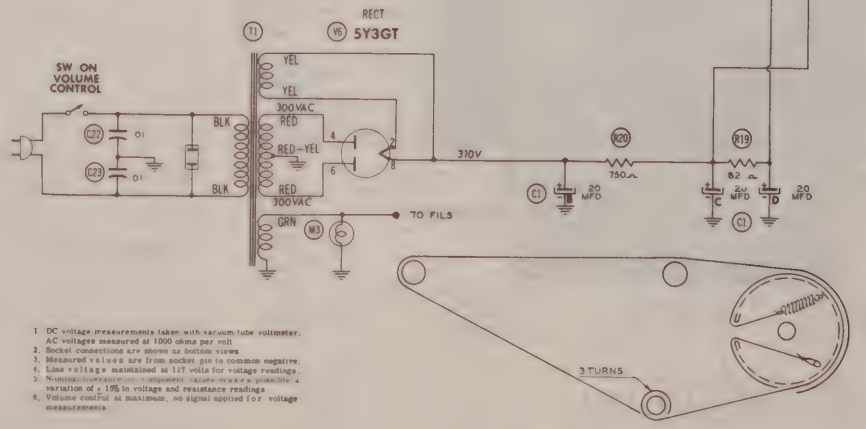
3924 MEADE ST.
DENVER, COLORADO

SILVERTONE
MODEL 4056, (Ch. 132.026-6)

SILVERTONE
MODEL 4056, (Ch. 132.026-6)





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BJ6	3.3Meg	330Ω	0Ω	.1Ω	↑ 6.3KΩ	↑ 24.3KΩ	0Ω	
V 2	6BE6	33KΩ	330Ω	0Ω	.1Ω	↑ 6.3KΩ	↑ 32.5KΩ	3.2Meg	
V 3	6BJ6	3.2Meg	470Ω	0Ω	.1Ω	↑ 6.3KΩ	↑ 24.3KΩ	0Ω	
V 4	6AV6	15 Meg	560Ω	0Ω	.1Ω	0Ω	1 Meg	↑ 472KΩ	
V 5	6V6GT	1Ω	.1Ω	↑ 1.2KΩ	↑ 1.6KΩ	470KΩ	INF.	[illegible]	270Ω
V 6	5Y3GT	INF.	200KΩ	INF.	178Ω	INF.	165Ω	INF.	200KΩ

↑ MEASURED FROM PIN 8 OF V6.

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

DIAL CORD STRINGING

255-12

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SILVERTONE MODELS
4204, 4206 (Ch. 132.067)

SILVERTONE MODELS
4204, 4206 (Ch. 132.067)

TRADE NAME	Silvertone Models 4204, 4206 (Ch. 132.067)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan St., Chicago, Ill.
TYPE SET	AC Operated AM-FM Superheterodyne Receiver
TUBES (Eight)	Types 6CB6 FM RF Amp., 12AT7 FM Mixer-Osc., 6BE6 AM Conv., (2) 6BA6 IF Amp., 6T8 FM Det.-AM Det.-AF Amp., 6V6GT Audio Output, 6X4 Rectifier
POWER SUPPLY	105-120 Volts AC- 50/60 Cycles RATING .41 Amp. @ 117 Volts AC
TUNING RANGE- BROADCAST	540-1600KC FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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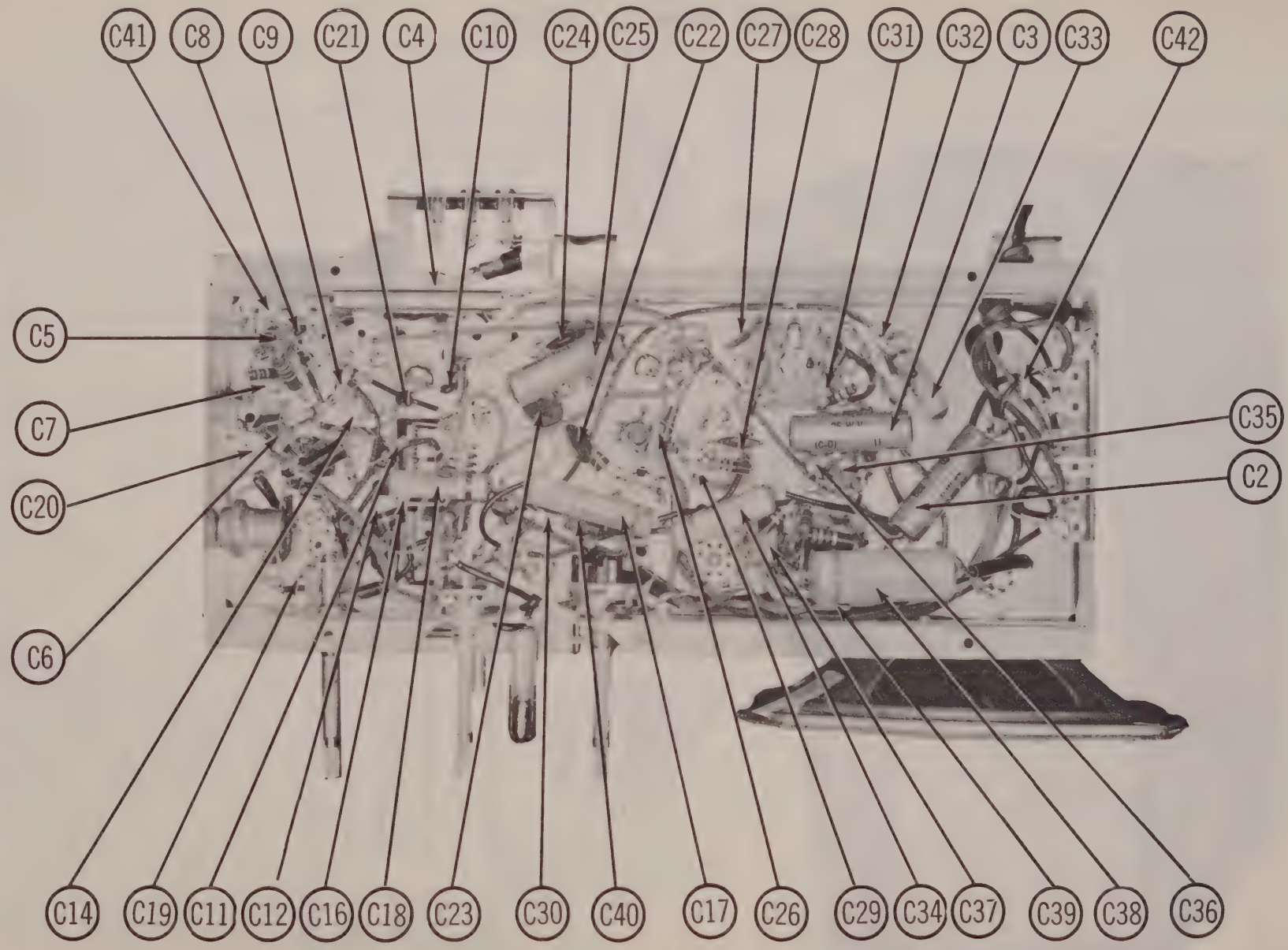
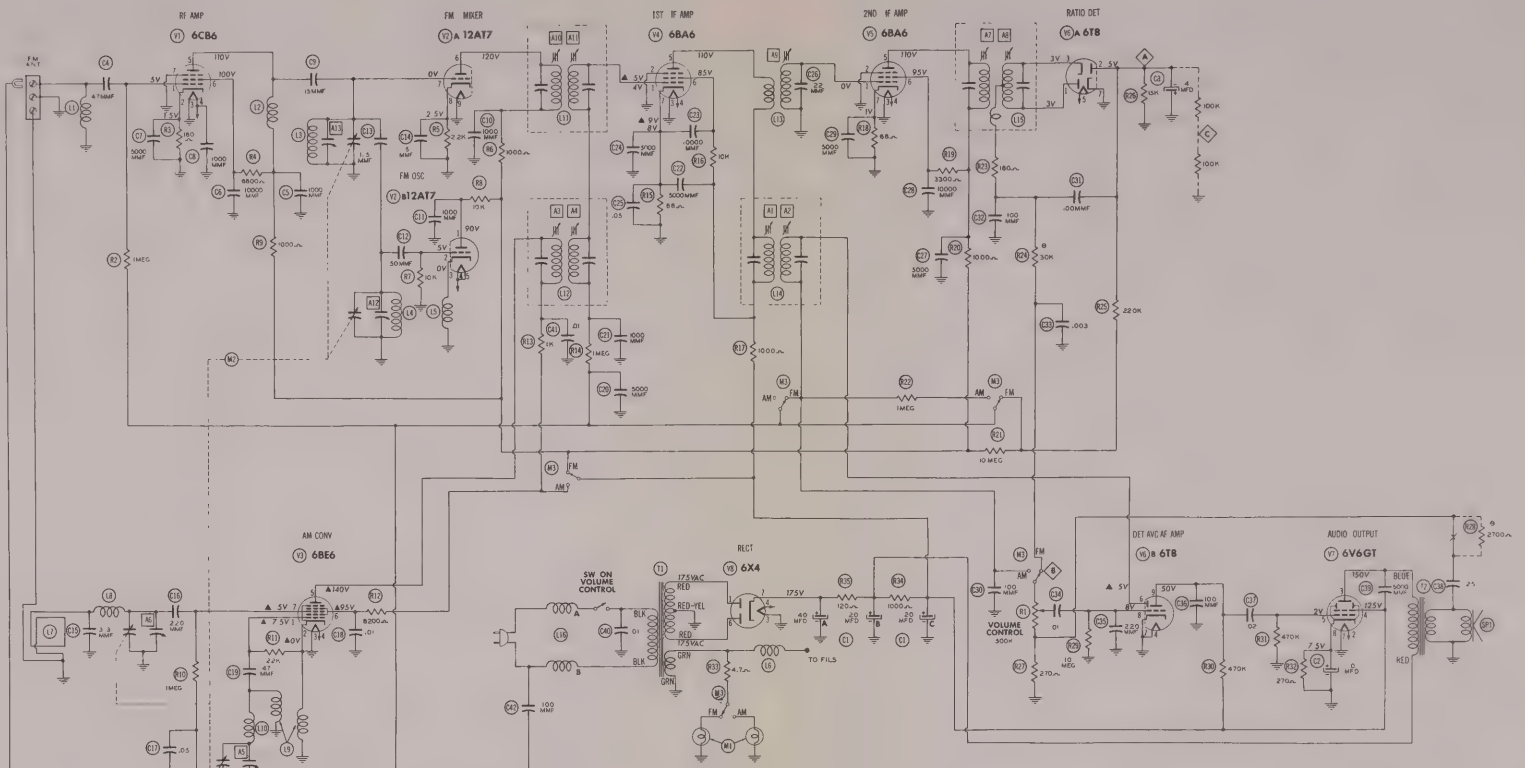


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



AM IF = 455KC
FM IF = 10.7 MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	140KΩ	180Ω	0Ω	10	† 2.1KΩ	† 9KΩ	0Ω		
V 2	12AT7	† 11KΩ	105Ω	40	10	10	† 5.1KΩ	0Ω	2.2KΩ	0Ω
V 3	6BE6	330KΩ * 5.1Meg	0Ω	0Ω	10	† 6.5.1KΩ	† 6.5.1KΩ	* 2.5Meg		
V 4	6BA6	140KΩ	0Ω	0Ω	0Ω	† 5.1KΩ	† 15.1KΩ	68Ω		
V 5	6BA6	0Ω	0Ω	0Ω	0Ω	† 2.1KΩ	† 5.4KΩ	68Ω		
V 6	6T8	330KΩ	105Ω	130KΩ	0Ω	10	* 500KΩ	0Ω	10 Meg	† 470KΩ
V 7	6V6GT	1MF	0Ω	† 130Ω	† 1.1KΩ	470KΩ	1MF	0Ω	270Ω	
V 8	6X4	1MΩ	† 0.33Ω † 1.1KΩ	0Ω	0Ω	† 1.1KΩ	1MΩ	68KΩ		

ALL READINGS TAKEN IN FM POSITION UNLESS OTHERWISE DESIGNATED
† MEASURED FROM PIN 1 OF V8.
* TAKEN IN AM POSITION.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage was adjusted to 117 volts for voltage readings.
5. Tolerance of resistors and capacitors must be kept close to assure possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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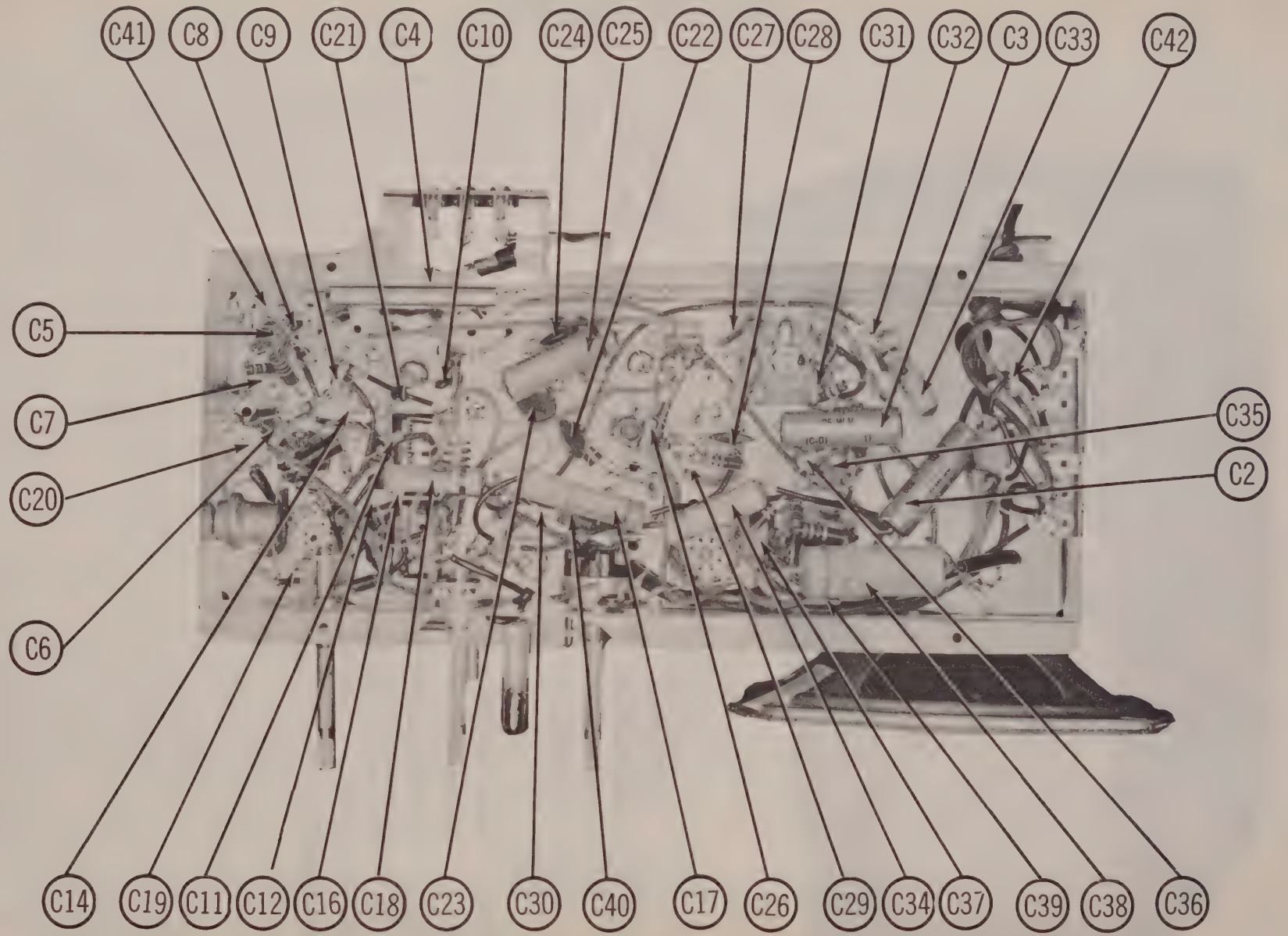
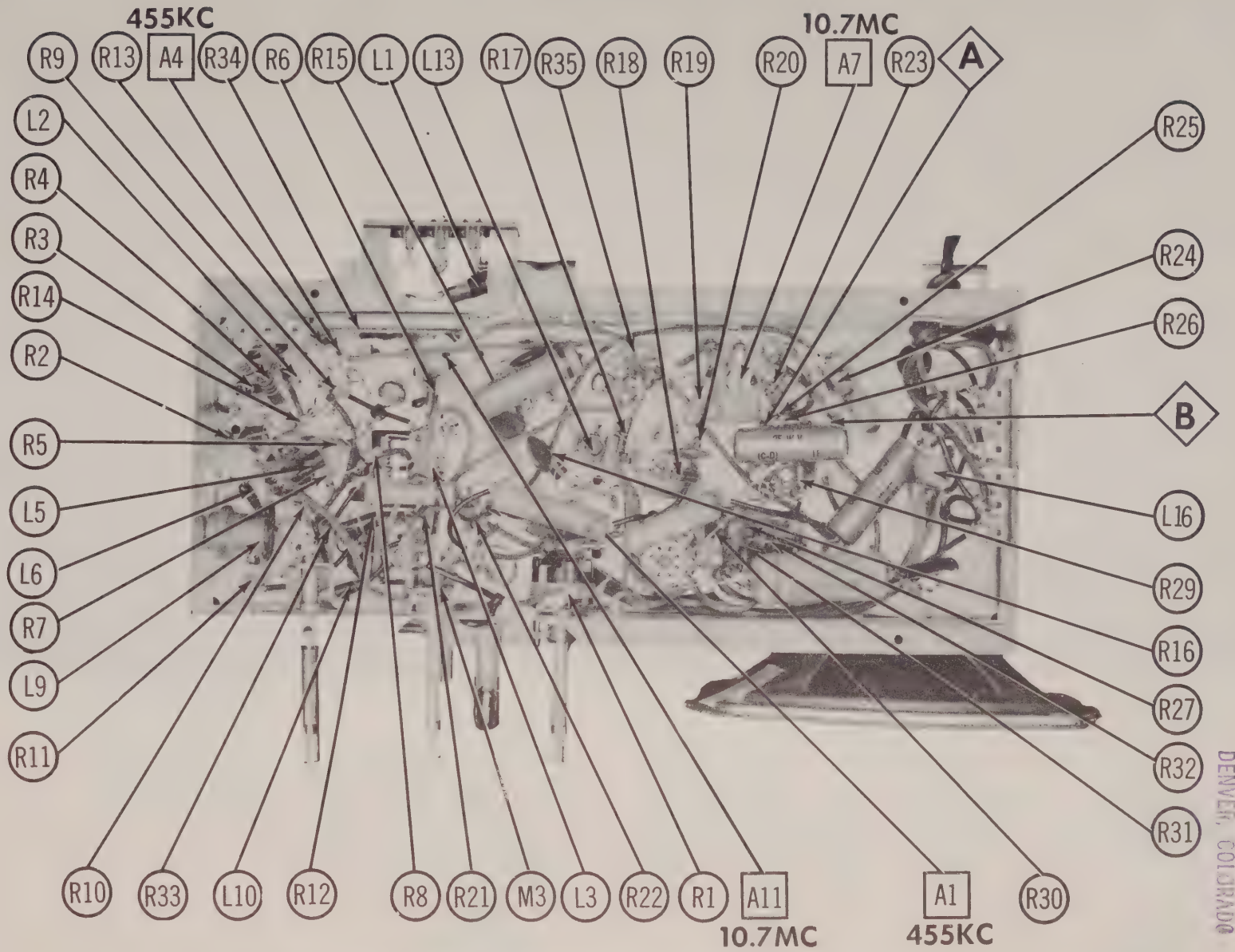


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

AM ALIGNMENT

Attenuate generator output to maintain 1.27 volts across output meter. Set volume control for maximum volume. Use insulated alignment tool.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	455KC (400%Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1600KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	Tune to 1400KC signal	"	A6	"
4.		"	600KC	"	Tune to 600KC signal	"		Bend slotted AM antenna rotor plates for maximum output. Repeat steps 2 and 3.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (A) to chassis. The junction of these two resistors is alignment point (C) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	.005MFD	High side to pin 1 (grid) of 6BA6 (V5). Low side to chassis.	10.7MC (Unmod)	FM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A7	Adjust for maximum deflection.
6.	"	"	"	"	"	DC probe to point (B). Common to point (C).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
7.	"	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	"	"	"	DC probe to point (A). Common to chassis.	A9, A10 A11	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	.005MFD	High side to pin 1 (grid) of 6BA6 (V5). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully open	Vert. Amp. to point (A). Low side to chassis.	A7	Disconnect stabilizing capacitor C3. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
6.	"	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	"	"	"	"	A9, A10 A11	"
7.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A8	Reconnect stabilizing capacitor C3. Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTY retouch A7 for maximum amplitude and straightness of crossover lines.

RF AND MIXER ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
8.	Two 150Ω Carbon Resistors	Across FM antenna terminals with 150Ω in each lead.	108.5MC (Unmod)	FM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A12	Adjust for maximum deflection.
9.	"	"	87.5MC	"	Tuning gang fully closed	"	L4	Adjust for maximum deflection by compressing or expanding coil turns. Repeat step 8.
10.	"	"	105MC	"	Tune to 105MC signal	"	A13	Adjust for maximum deflection.
11.	"	"	91MC	"	Tune to 91MC signal	"	L3	Adjust for maximum deflection by compressing or expanding coil turns. Repeat step 10.

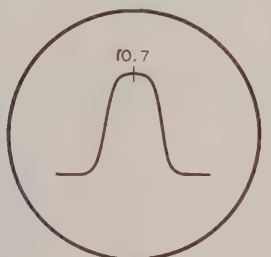


FIG. 1

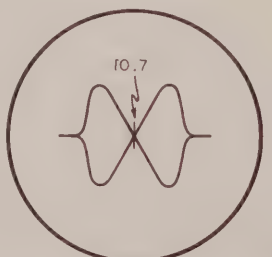


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

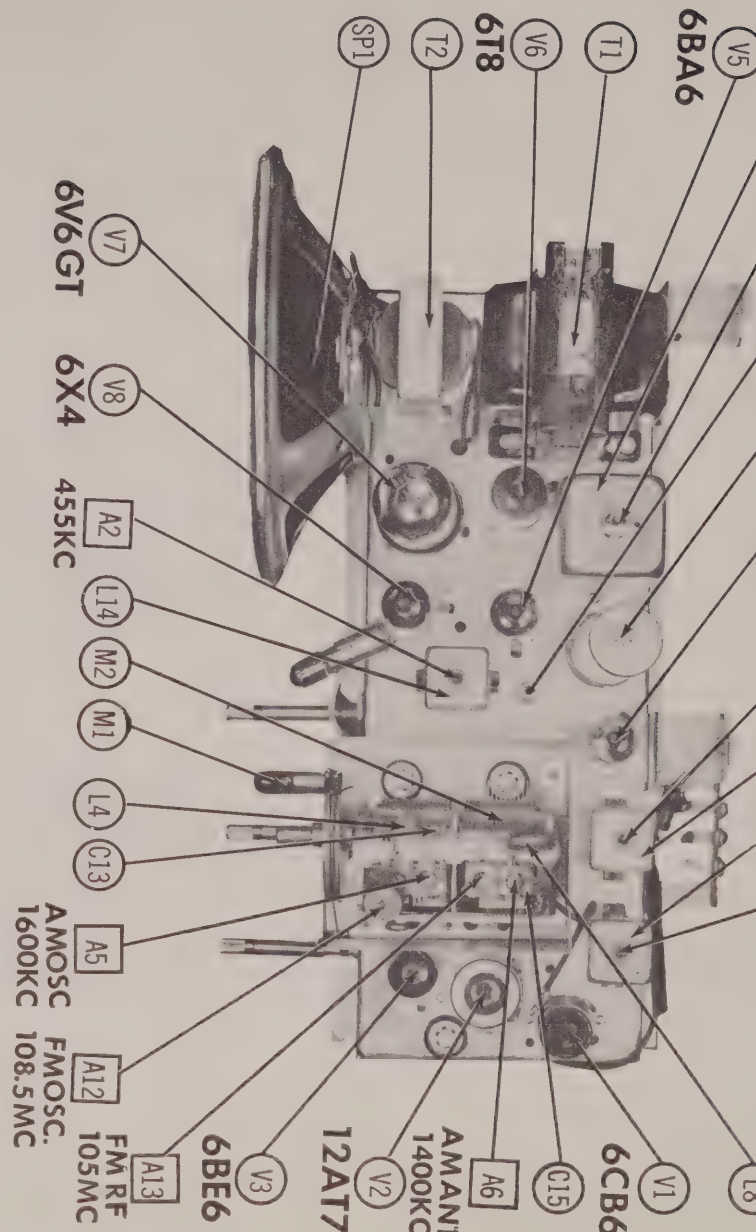
ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier	6CB6	6CB6	7CM	
V2	FM Mixer & Osc.	12AT7	12AT7	9A	
V3	AM Conv. .	6BE6	6BE6	7CH	
V4	1st IF Amplifier	6BA6	6BA6	7BK	
V5	2nd IF Amplifier	6BA6	6BA6	7BK	
V6	Ratio Det-AM Det-AVC-AF Amp.	6T8	6T8	9E	
V7	Audio Output	6V6GT	6V6GT	7S	
V8	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	250	N22806	AFH3-20		C016		FP230	TVL-3540	
B	▲20	250						TC55		
C	20	250								
C2	10	25	N22602	PRS25/10		BR102		TC22	TVA-1204	
C3	4	25	N22659	PRS150/4		BR550		TC30	TVA-1203	
C4	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C5	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C6	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C8	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C9	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C10	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C11	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C12	50									
C13	1.5			SI1.5NP0	TCZ-1.5	TZ04	NP0K-1R5	ZT-5515	5TCCB-V15	
C14	15			SI15	D6-150	TP11	GP1K-150	UC-5415	5GA-Q15	
C15	3.3			SI3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-V33	
C16	220			SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C17	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C18	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C19	47			SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C20	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C21	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C22	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C23	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C24	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C25	.05	200		P288-05	DF-502	PJ2S5		PT415	2TM-S5	
C26	22	500		1468-00025		5W5Q22		MCE220	MS-42	
C27	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C28	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C29	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C30	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C31	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C32	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C33	.003	600		P688-003	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C34	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C35	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C36	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C37	.02	400		P488-02		CUB4S2		PT412	4TM-S2	
C38	.25	200		P288-25		PJ2P25		PT4025	2TM-P25	
C39	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C40	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C41	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C42	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	

CHASSIS—TOP VIEW



PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	N41462	Q13-133	A47-500K-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R2	1 Meg	½		BTS-1 Meg	
R3	180Ω	½		BTS-180	
R4	6800Ω	1		BTA-6800	
R5	2200Ω	½		BTS-2200	
R6	1000Ω	½		BTS-1000	
R7	10KΩ	½		BTS-10K	
R8	10KΩ	½		BTS-10K	
R9	1000Ω	½		BTS-1000Ω	
R10	1 Meg	½		BTS-1 Meg	
R11	22KΩ	½		BTS-22K	
R12	8200Ω	1		BTA-8200	
R13	1000Ω	½		BTS-1000	
R14	1 Meg	½		BTS-1 Meg	
R15	68Ω	½		BTS-68	
R16	10KΩ	1		BTA-10K	
R17	1000Ω	½		BTS-1000	
R18	68Ω	½		BTS-68	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SILVERTONE PART No.	IRC PART No.	
R19	3300Ω	1		BTA-3300	
R20	1000Ω	½		BTS-1000	
R21	10 Meg	½		BTS-10 Meg	
R22	1 Meg	½		BTS-1 Meg	
R23	180Ω	½		BTS-180	
R24	30KΩ	½		BTS-30K	Note 1
R25	220KΩ	½		BTS-220K	
R26	15KΩ	½		BTS-15K	
R27	270Ω	½		BTS-270	
R28	2700Ω	½		BTS-2700	Note 2
R29	10 Meg	½		BTS-10 Meg	
R30	470KΩ	½		BTS-470K	
R31	470KΩ	½		BTS-470K	
R32	270Ω	1		BTA-270	
R33	4.7Ω	1			
R34	1000Ω	10			
R35	120Ω	1			

Note 1. Some models may use a 39KΩ resistor in this application.
Note 2. Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .41A	360VCT .070ADC	6.3VAC @ 3.4A		N22959					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SILVERTONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	4.9KΩ	3.9Ω	N23669-2	A-3877	A-2930	S-3X	Z1000	24S51	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM	3.9Ω	N41437	ST-108 Mod. P6-X	6A1	

CHASSIS—BOTTOM VIEW

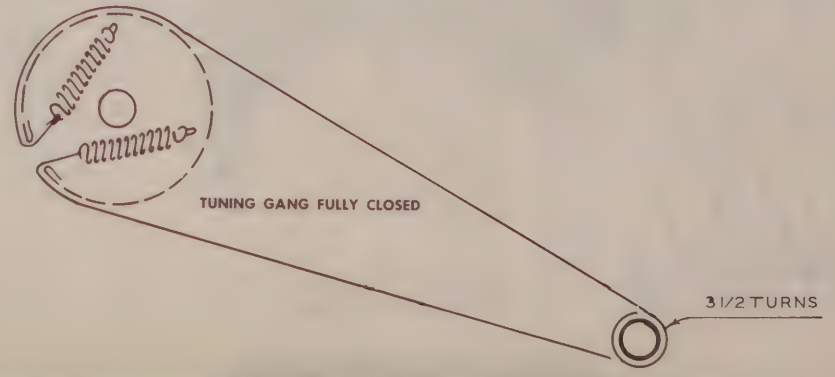
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Choke	0Ω		N22648-1	19-1001		4604	1.5 Microhenries
L2	FM RF Choke	.7Ω		N21445-1	19-1004		4610	7.5 Microhenries
L3	FM RF Coil	0Ω		N25593-1				
L4	FM Osc. Coil	0Ω		N22594-1				
L5	Cathode Choke	.4Ω		N22597-1	19-1002		4606	3 Microhenries
L6	Fil. Choke	.8Ω		N21673	19-1005		4624	14 Microhenries
L7	AM Loop Ant.	.3Ω	3Ω	N41487-1				
L8	AM Ant. Loading Coil	.6Ω		N24772-1	19-1004		4610	8 Microhenry
L9	AM Osc. Coil	.6Ω	7Ω	N22587-1	14-1074	BC-381 ■	70-Osc.	
L10	Parasitic Suppressor	0Ω		N22334-1	19-3001	TV-189	6175	.5 Microhenry
L11	1st FM IF	1.1Ω	1.1Ω	N40690	16-3487 *	FM-251	1451	
L12	1st AM IF	10Ω	10Ω	N24771	16-6758 *	BC-352 *	1312-C1	
L13	2nd FM IF	.3Ω	.5Ω	N40614-1				
L14	2nd AM IF	10Ω	10Ω	N24771	16-6758 *	BC-353 *	1312-C2	
L15	Ratio Det.	.9Ω	.1ΩCT	N22592-1	17-3487	FM-255 *	1465 *	Tertiary winding=.25Ω
L16A	Line Choke	.1Ω		N24308-1	19-1002		4606	3 Microhenries
B	Line Choke	.1Ω			19-1002		4606	3 Microhenries

* Use adaptor plate.
■ Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Dial light	N19351	Bayonet # 47 (2 used)
M2	Tuning cap.	N40613	31-548 MMF, 17-135MMF
M3	Switch	N41440	AM-FM
	Trimmer		FM Osc.
	Cabinet	N41470-1	Maroon; model 4204
	Cabinet	N41470-2	Ivory; model 4206
	Knob	N41480-1	On-off volume; maroon-Model 4204
	Knob	N41480-4	On-off volume; ivory-Model 4206
	Knob	N41480-2	AM-FM maroon-Model 4204
	Knob	N41480-5	AM-FM ivory-Model 4206
	Knob	N41480-3	Tuning-maroon-Model 4204
	Knob	N41480-6	Tuning-ivory-Model 4206
	Pointer	N41435-1	Maroon; Model 4204
	Pointer	N41435-2	Ivory; Model 4206



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SPARTON MODELS 11T210,
12A204, 12A210, 14A204 (Ch. 23U214)

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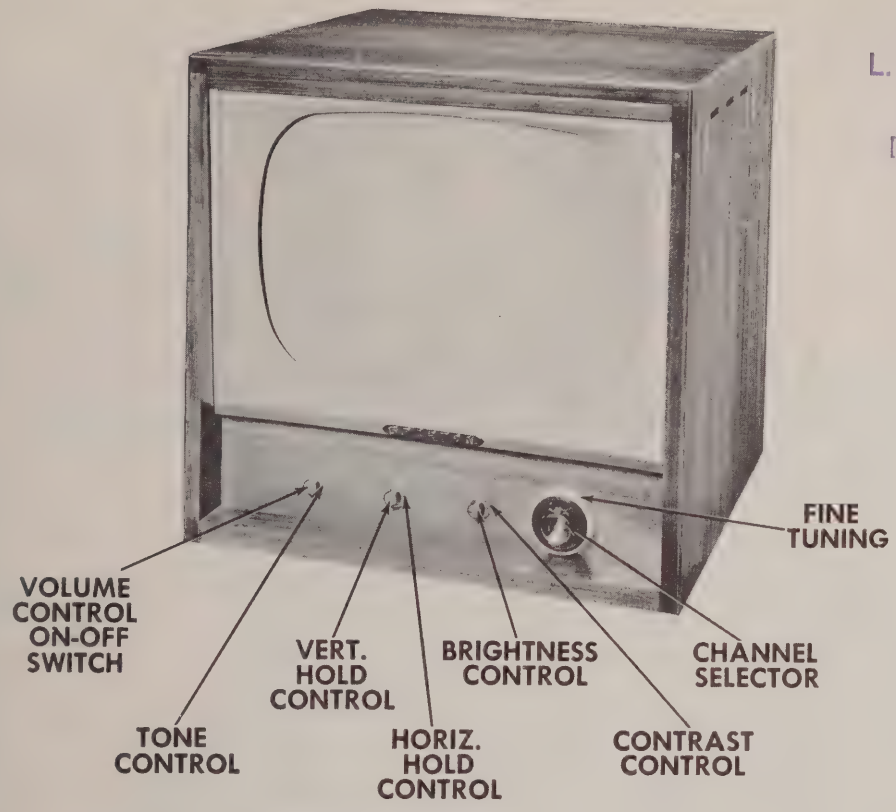

SPARTON MODEL 11T210

TRADE NAME	Sparton Models 11T210, 12A204, 12A210, 14A204 (Ch. 23U214)
MANUFACTURER	Sparks-Withington Co., Jackson, Mich.
TYPE SET	Television Receiver
TUBES	Twenty-four
POWER SUPPLY	110-120 Volts AC-60 cycle
RATING	1.96 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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SPARTON MODELS 11T210, 12A204, 12A210, 14A204 (Ch. 23U214)

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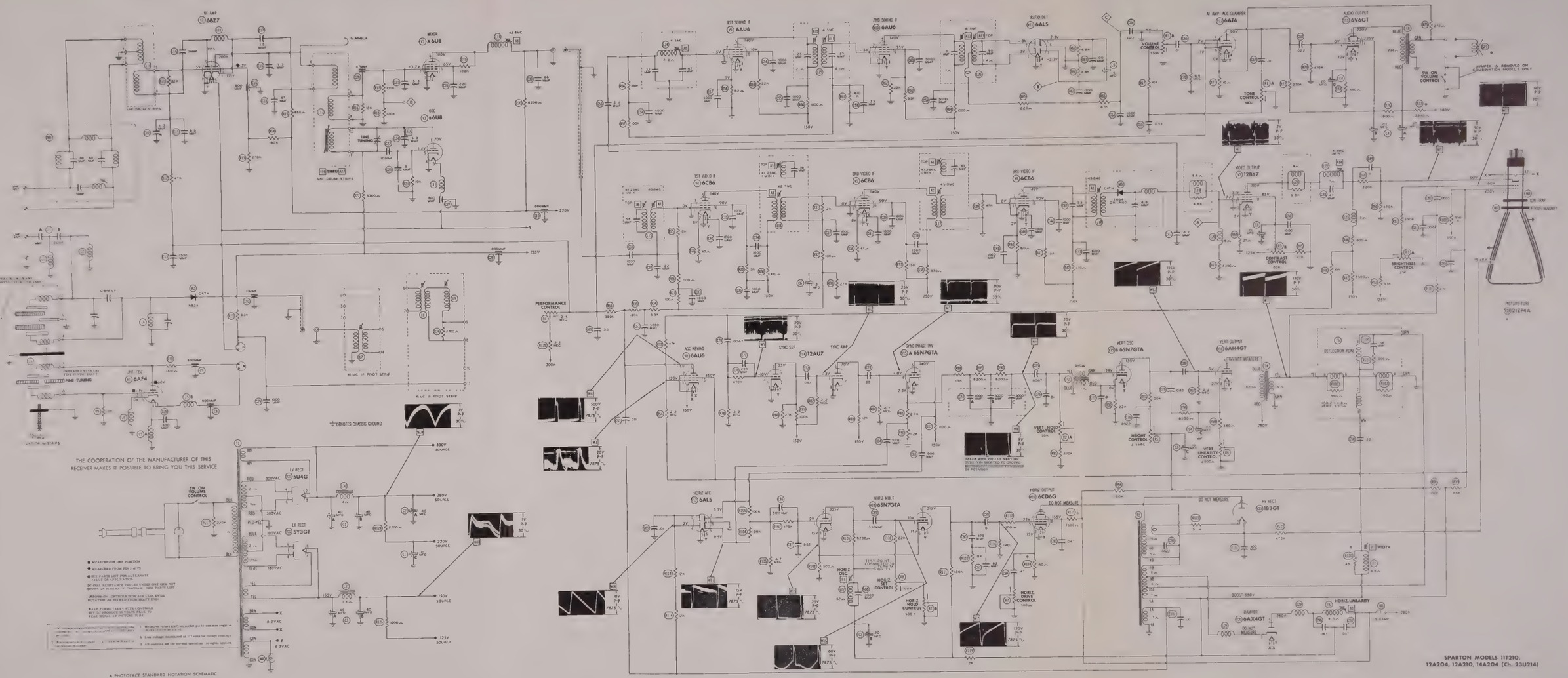
DATE 10-54 SET 255 FOLDER 14



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CHASSIS TOP VIEW

SPARTON

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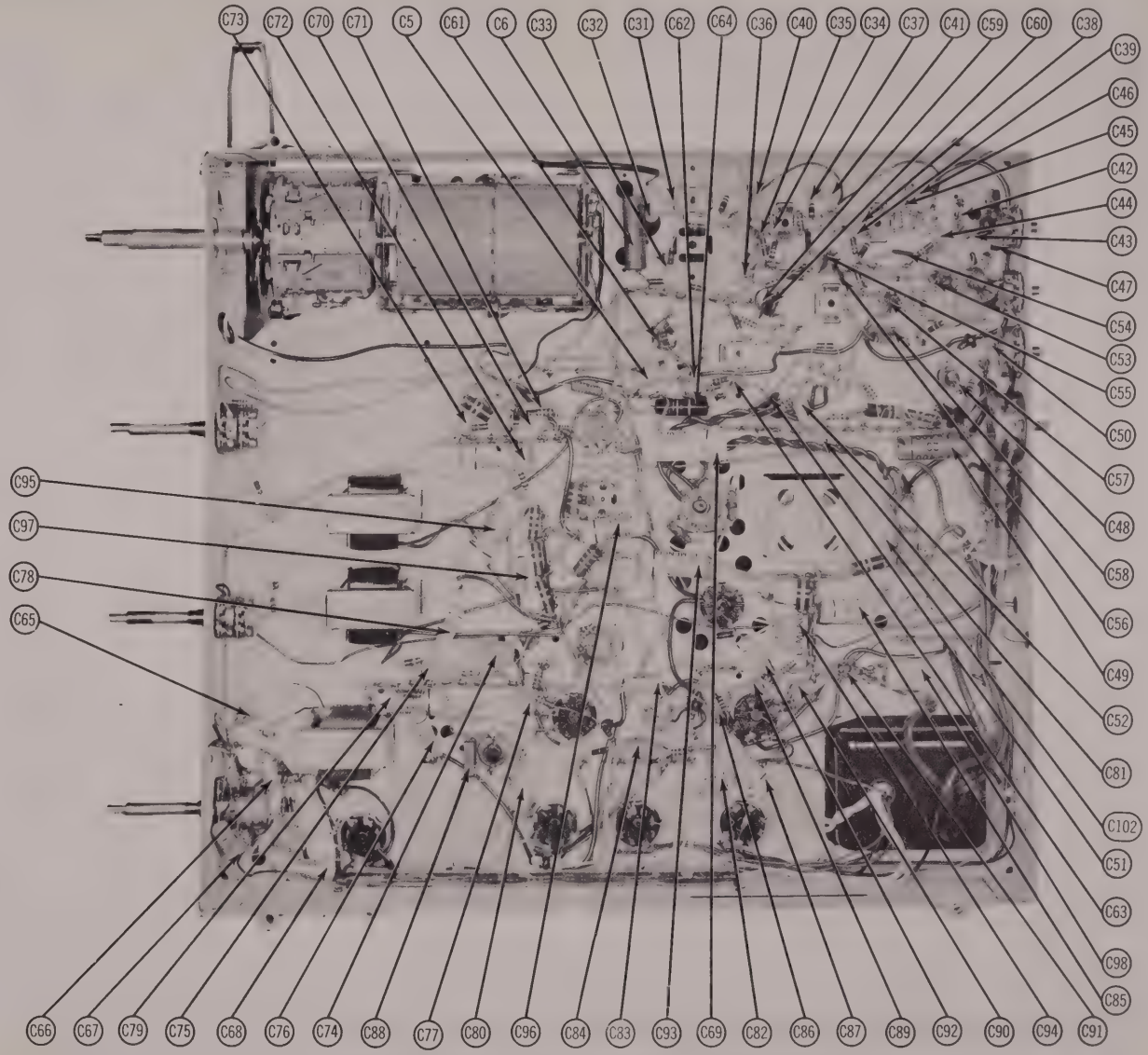
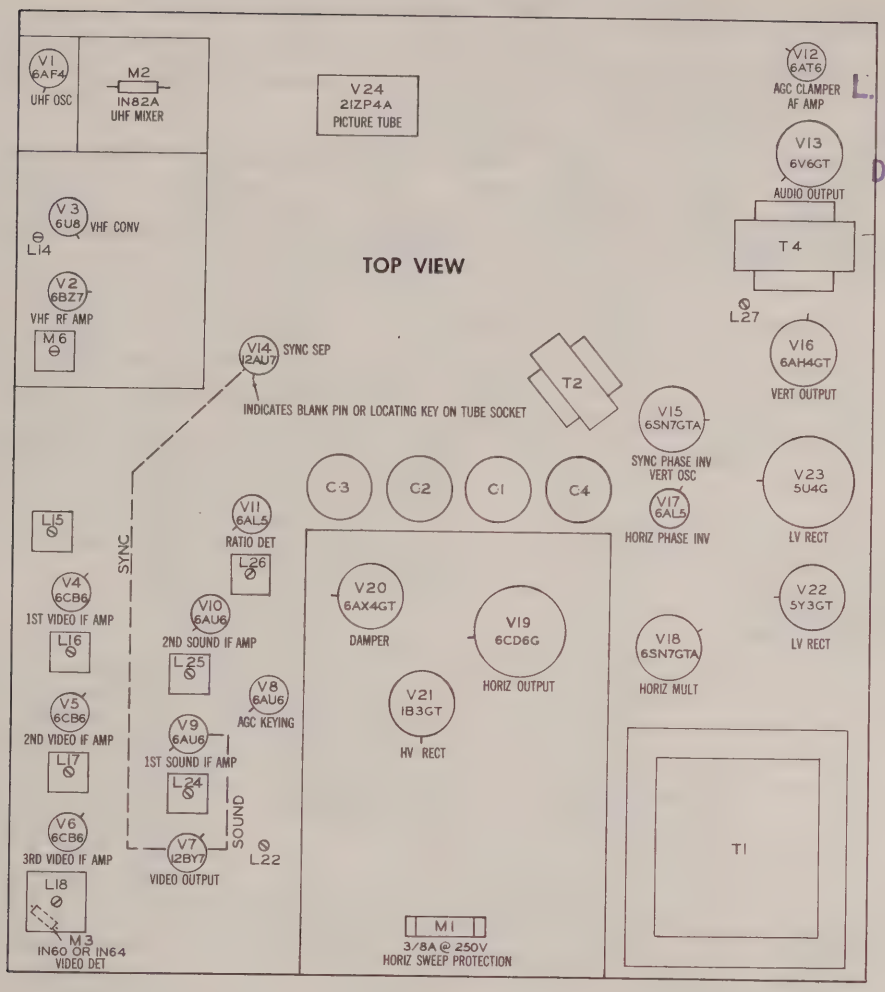


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, V23

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V7, V8, V24
Has pic, no sound - V9, V10, V11, V12, V13
Overloaded picture - V8, V12

SYNC FAILURE
No vert. sync - V15
No horiz. sync - V15, V17, V18
No vert. or horiz. sync - V14, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V24, Fuse (M1)
No vertical deflection - V15, V16
Poor vert. linearity or foldover - V15, V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22, V23
Vert. off freq. - V15
Horiz. off freq. - V15, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube (V18) to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the RF amplifier tube (V2) and the AGC keying tube (V8) from their sockets.
Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C6. Connect the positive lead to chassis. Set tuner to channel 12 or any other unused high band channel.
Use only enough generator output to provide usable indication on VTVM and scope.
Connect a 50MMF capacitor across the vertical input terminals of oscilloscope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	Not used	43.8MC (Unmod)	12	Use VTVM. DC probe thru 1Meg to point Ⓐ. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	"	45.0MC	"	"	A2	"
3.	"	"	"	42.7MC	"	"	A3	"
4.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
5.	"	"	"	41.25MC	"	"	A5	"
6.	"	"	44MC (10MC Swp)	41.25MC 42.7MC 45.0MC 47.25MC	"	Vert. amp. thru 47KΩ to point Ⓐ. Low side to chassis.		If necessary, retouch A1, A2 and A3 for flat response from 42.7MC to 45MC as in Fig. 1. Retouch A4 and A5 to place 41.25MC and 47.25MC markers in trap notch as in Fig. 1.
7.	"	High side to pin 2 (grid) of 6U8 (V3). Low side to tuner chassis. (Make connection to free end of small length of insulated wire wrapped around pin 2)	Not used	41.25MC (Unmod)	"	Use VTVM. DC probe thru 1Meg to point Ⓐ. Common to chassis.	A6	Adjust for MINIMUM deflection.
8.	"	"	"	43.8MC	"	"	A7	Detune A8 fully counter clockwise. Adjust A7 for maximum deflection.
9.	"	"	"	43.8MC	"	"	A8	Shunt L15 with a 1KΩ resistor. Adjust A8 for maximum deflection.
10.	"	"	44MC (10MC Swp)	41.25MC 42.7MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 47KΩ to point Ⓐ. Low side to chassis.		Check for response similar to Fig. 1. If necessary, slightly retouch A7 and A8 to obtain flat topped response. 45.75MC should fall at 50% on response curve. Check 41.25 and 47.25MC markers. If necessary, slightly retouch A4, A5 and A6 to place markers in trap notches as in Fig. 1.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove V6 from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A9, A10, A11, A12	Adjust for maximum deflection.
12.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V6 in its socket.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.
Remove V6 from its socket.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.001MFD	High side to point Ⓐ. Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A9, A10 A11, A12	Disconnect stabilizing capacitor C5. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
12.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A13	Reconnect stabilizing capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines. Replace V6 in its socket.

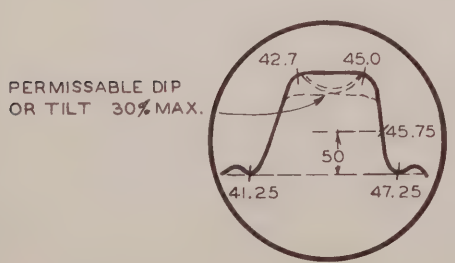

FIG.1

FIG.2

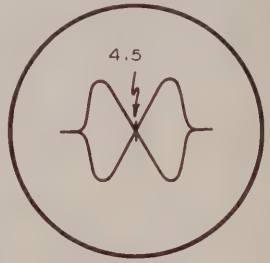

FIG.3

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ALIGNMENT INSTRUCTIONS (cont)

4.5MC TRAP ALIGNMENT

Remove V6 from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig.4) to pin 1 (cathode) of picture tube.	A14	Adjust for MINIMUM deflection.

VHF OSCILLATOR ALIGNMENT

Replace the RF amplifier tube (V2) in its socket.
Leave the bias connected as under "Video IF alignment".
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A15. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just above and slightly to the left of the fine tuning shaft. This hole extends thru the UHF tuner on all VHF channels.
The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A27	

VHF RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

UHF OSCILLATOR ALIGNMENT

The UHF channel strip adjustments are reached thru the same hole provided for VHF oscillator adjustments.
Tune in any UHF station available and adjust the channel strip oscillator adjustment screw for clearest picture and best sound.
Repeat the procedure, if necessary, for all other available UHF stations in that area.

UHF RF AND MIXER ALIGNMENT

The UHF RF and Mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

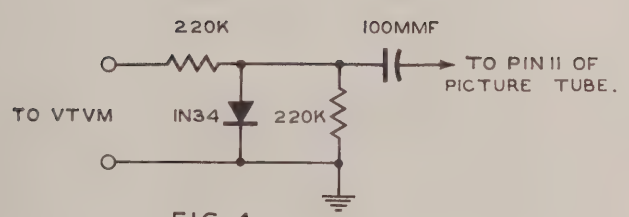


FIG.4

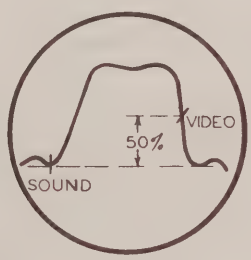
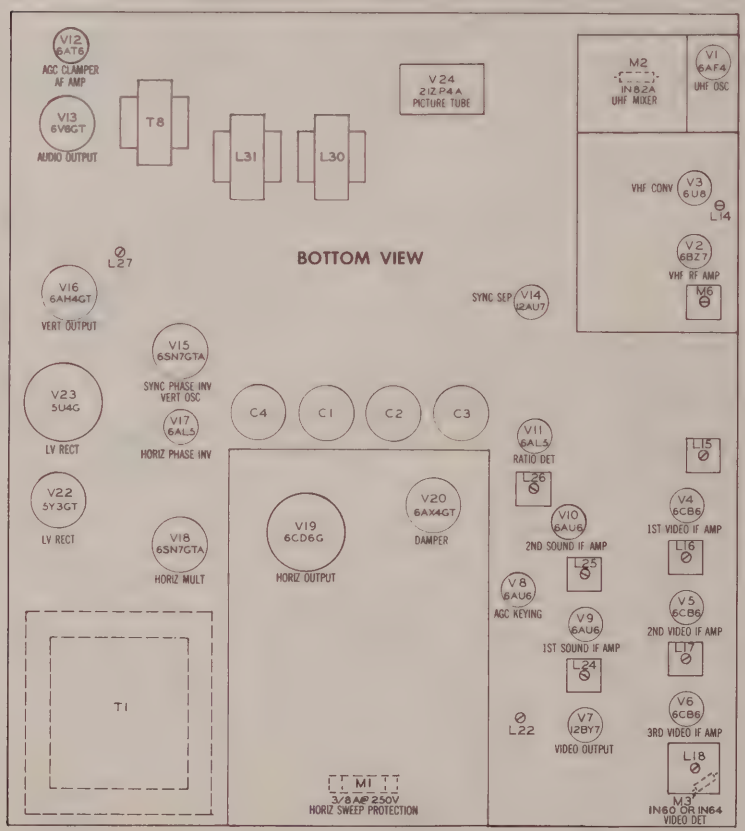


FIG.5

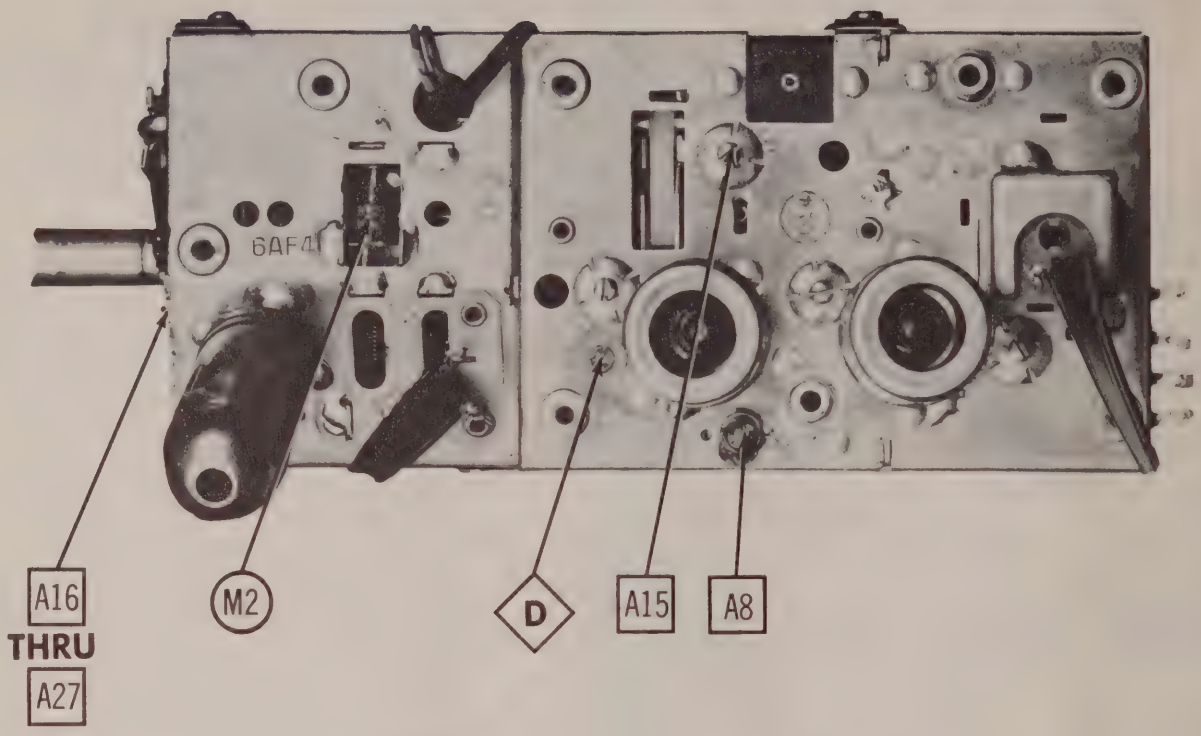
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■5.6KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	†■5.6KΩ		
V 2	6BZ7	▲3.5KΩ	100KΩ	INF	0Ω	.1Ω	INF	650KΩ	0Ω	0Ω
V 3	6U8	†5.5KΩ	200KΩ	▲100KΩ	.1Ω	0Ω	▲11KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	28KΩ	47Ω	0Ω	.1Ω	†585Ω	†15KΩ	0Ω		
V 5	6CB6	27KΩ	47Ω	0Ω	.1Ω	†585Ω	†15KΩ	0Ω		
V 6	6CB6	.2Ω	180Ω	0Ω	.1Ω	†585Ω	†15KΩ	180Ω		
V 7	12BY7	27Ω	4.3KΩ	0Ω	0Ω	0Ω	.1Ω	†5.2KΩ	20KΩ	0Ω
V 8	6AU6	†60KΩ	†115Ω	†115Ω	†115Ω	†210KΩ	¶68KΩ	†115Ω		
V 9	6AU6	670KΩ	0Ω	0Ω	.1Ω	†2KΩ	†22KΩ	82Ω		
V 10	6AU6	470KΩ	0Ω	0Ω	.1Ω	†2KΩ	†20KΩ	0Ω		
V 11	6AL5	INF	INF	0Ω	.1Ω	6.8KΩ	0Ω	6.8KΩ		
V 12	6AT6	6.8Meg	10Ω	0Ω	.1Ω	600KΩ	600KΩ	▲270KΩ		
V 13	6V6GT	INF	.1Ω	▲2.5KΩ	▲4KΩ	470KΩ	INF	0Ω	390Ω	
V 14	12AU7	†35KΩ	2.7Meg	0Ω	0Ω	0Ω	†12KΩ	†2.2Meg	0Ω	.1Ω
V 15	6SN7GTA	650KΩ	¶1.4Meg	107Ω	4.7Meg	†2KΩ	3.9KΩ	.1Ω	0Ω	
V 16	6AH4GT	2.2Meg	0Ω	INF	INF	▲784Ω	1KΩ	.1Ω	1.6KΩ	
V 17	6AL5	24KΩ	24KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 18	6SN7GTA	5.2Meg	¶20KΩ	1.5KΩ	100KΩ	¶192KΩ	1.5KΩ	0Ω	.1Ω	
V 19	6CD6G	INF	0Ω	150Ω	1Meg	1Meg	INF	.1Ω	▲7.6KΩ	TOP CAP ¶8Ω
V 20	6AX4GT	INF	¶.6Ω	100KΩ	INF	▲125Ω	▲125Ω	†115Ω	†115Ω	
V 21	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ¶183Ω
V 22	5Y3GT	0Ω	20KΩ	INF	20Ω	220KΩ	21Ω	INF	20KΩ	
V 23	5U4G	INF	50KΩ	INF	21Ω	INF	19Ω	INF	50KΩ	
V 24	21ZP4A	†115Ω	†400KΩ	PIN 10 ¶68KΩ	PIN 11 ¶160KΩ	PIN 12 †115Ω				

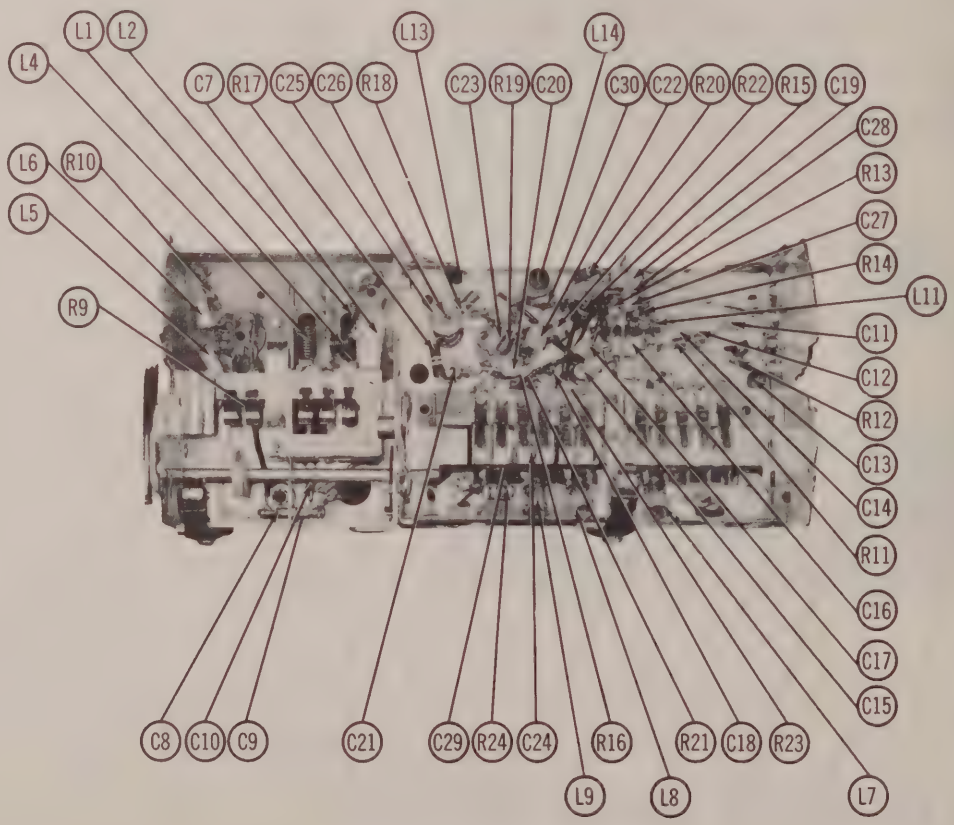
† MEASURED FROM PIN 8 OF V22
■ MEASURED IN UHF POSITION
▲ MEASURED FROM PIN 8 OF V23
¶ MEASURED FROM PIN 3 OF V20



TUBE PLACEMENT CHART



RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

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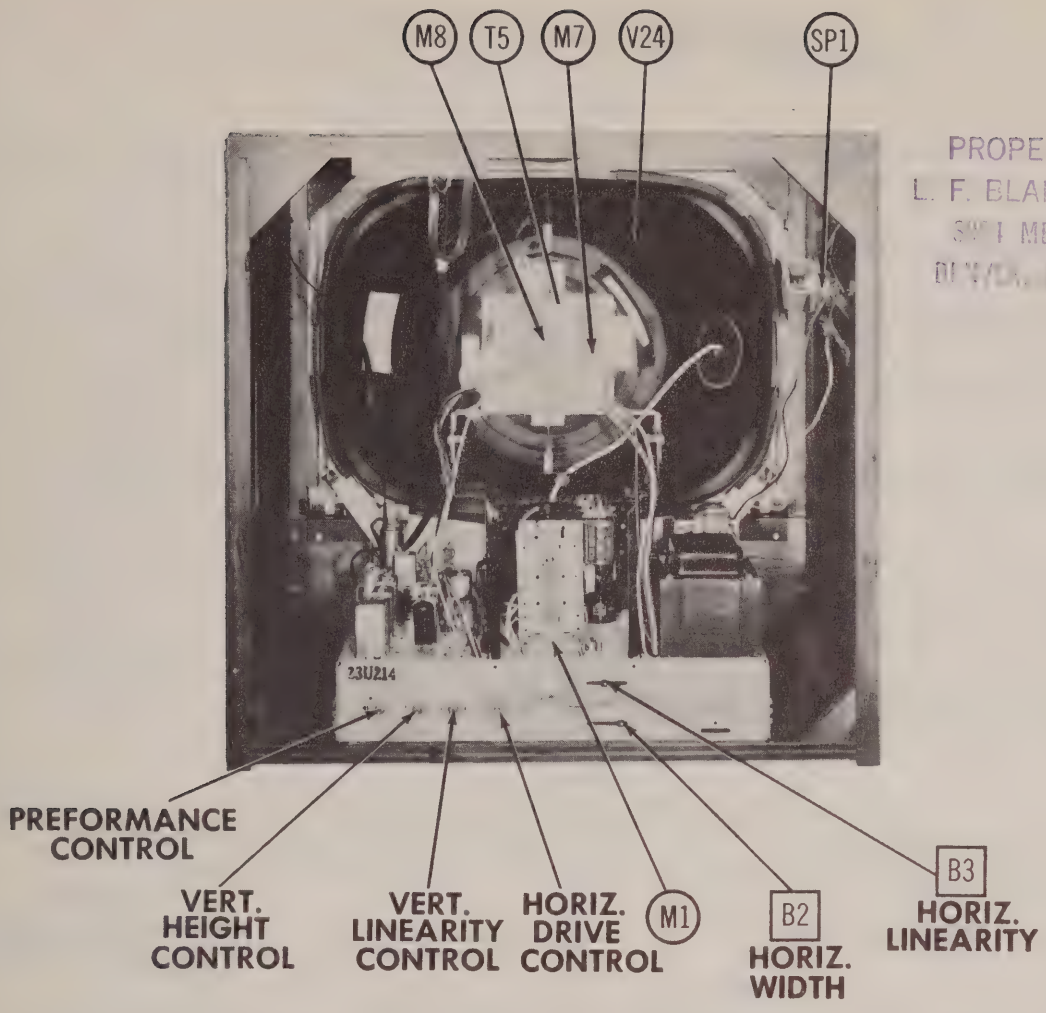

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Remove V17 (6AL5) from its socket and set the horizontal hold control fully counter clockwise.

Shunt L27 with a .1MFD @ 400V capacitor from test point (terminal #7 or high voltage transformer) to ground.

Adjust the horizontal set control (R8A) until the picture appears to float in horizontal sync.

Remove .1MFD capacitor across L27 and adjust the horizontal oscillator slug (B1) until the picture appears to float in horizontal sync.

Replace V17 in its socket.

Two or three diagonal bars should appear just before picture pulls into sync as horizontal hold control is turned toward its mid-range position.

Adjust the horizontal drive control clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width coil slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check adjustments B2, B3 and R7. Check by substitution V19, V20 and V23. Check T3, T5A, R119, C93 and other associated components.

DRIVE LINES

Check adjustments R7 and B3. Check by substitution V19 and V20. Check R118, R7, C94, C92 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V19 and V20. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V18, V19 and V20. Check C87 for open. Check R108, C86, C85 and other associated components.

XMAS TREE EFFECT

Check by substitution V18, V19, V20. Check L27, C88, C89, C92 and other associated components. Check T3 and T5A for internal arcing.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R98, R6 and other associated components.	Check T2, R93, R5, R95, C80, C78 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V15 and V16. Check height and vertical linearity controls for proper operation. Check T4, T5B and other associated components.

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check R5, R93, C78, C2C and other associated components.

COMPRESSED AT TOP

Check by substitution V15 and V16. Check R6, R98, C4C and other associated components.

FOLDS

Check by substitution V15 and V16. Check C79, R96, R98, R6 and other associated

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V14 and V15. Check R48, R81, R83, R87, C70, C72, C73 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T2, R2A, C76, C77, R92 and other associated components.	Check vertical integrator network for component failure or change of value.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check waveform W15.

If Satisfactory	If Unsatisfactory
Check R2B, R8, L27, C89, C88 and other associated components.	Check horizontal AFC network for component failure or change of value.

HORIZONTAL BENDING

Check by substitution V8, V14, V15, V16. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V7. Check R47, R46, contrast control, C3C, C50, L23 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A14. Check video IF alignment.

POOR CONTRAST

Substitute V7. Check contrast control, picture tube, L20 and R43. Check video crystal detector network and other associated components.

NEGATIVE PICTURE

Check by substitution V7 and V8. Check video crystal detector network. Check picture tube and other associated components.

SMEAR

Substitute V7. Check L19, L20, L21, L23, R49, C49 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7 and V8 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10, V11, V12 and V13. Check stages V12 and V13 using audio signal generator. Apply audio signal across R1B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF stages for component failure or change of value.	Check C66, C68, R77, R76, R72, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A13 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		SPARTON PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	VHF RF Amplifier	6BZ7	6BZ7	9AJ	
V3	VHF Converter	6U8	6U8	9AE	
V4	1st Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	1st Sound IF Amp.	6AU6	6AU6	7BK	
V10	2nd Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amplifier-AGC Clamper	6AT6	6AT6	7BT	
V13	Audio Output	6V6GT	6V6GT	7S	
V14	Sync Separator	12AU7	12AU7	9A	
V15	Sync Phase Inv. - Vert. Oscillator	6SN7GTA	6SN7GTA	8BD	
V16	Vert. Output	6AH4GT	6AH4GT	8EL	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6CD6G	6DC6G	5BT	
V20	Damper	6AX4GT	6AX4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5Y3GT	5Y3GT	5T	
V23	LV Rectifier	5U4G	5U4G	5T	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA					RETMA BASE TYPE	NOTES
	SPARTON PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.		
V24	21ZP4A 21ZP4B ①	21ZP4A 21ZP4B ①	21ZP4A 21ZP4B ①	21ZP4A 21ZP4B ① 21ZP4 ②	21ZP4A 21ZP4B ①	12N 12N 12D	① Aluminized ② Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▰40	450	PA-4307-35	AFH3-155		C034		FP376.8	TVL-3785	
B	■40	450								
C	▲10	350								
C2A	▰40	475								
B	■20	475	PA-4307-33	AFH3-50		D068		FP396.12	TVL-4840	
C	▲10	475								
C2A	■40	350								
B	▰60	350	PA-4307-34	AFH2-61		C023		FP375.6	TVL-2770	
C	▲20	200		PRS250/20					TVA-1508	
C4A	▰20	450								
B	■20	400	PA-4307-36	AFH4-80		C159		FP437	TVL-4740	
C	▲100	50				BR205				
D	20	50								
C5	5	50	PA-4308-2	PRS150/4		BR550		TC30	TVA-1303	
C6	2	50	PA-4303-14	PRS150/4		BBR2-50T		TC302	TVA-1301	
C7A	1									
B	2									
C8	800			EF-001	MFT-1000				503C-D1	
C9	800			EF-001	MFT-1000				503C-D1	
C10	10									
C11	6.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C12	.5-3				829-3		3115-01-0R5	CT-565A		
C13	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C14	3			SI3NP0	TCZ-3	Z007	NP0K-030	ZT-5533	5TCCB-V33	
C15	.5-3				829-3		3115-01-0R5	CT-565A	5TCCB-V68	
C16	800			EF-001	MFT-1000				503C-D1	
C17	1.5			SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C18	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C19	800			EF-001	MFT-1000				503C-D1	
C20	47									
C21	.5-3				829-3		3115-01-0R5	CT-565A	5TCCB-V68	
C22	10			SI10N750	TCN-10	N018	N750K-100	NT-541	5TCU-Q1	
C23	5									
C24	.5-3				829-3		3115-01-0R5	CT-565A	5TCCB-V 68	
C25	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C26	220			BPD-00022	D6-221	G051	GP2K-221	UC-5322	5GA-T22	
C27	800			EF-001	MFT-1000				503C-D1	
C28	800			EF-001	MFT-1000				503C-D1	
C29	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C30	68									
C31	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C32	22		CC34A-220F	SI22NP0	TCZ-22	TP22	NP0K-220		5TCC-Q22	
C33	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C34	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C35	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C37	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C41	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C42	3.3Ω		PA-4326-4	SI3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-V33	
C43	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C44	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C45	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C46	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C47	4.7		PA-4328-11	SI4.7NP0	TCZ-4.7	TZ07	NP0K-4R7	ZT-5547	5TCCB-V47	
C48	47		CC30A-470F	SI47N750	TCN-470	TN14	N750K-470	NT-5447	5TCU-Q47	
C49	.1	400	PC42GL-104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C50	1000		PA-4334-6	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	5000		PA-4334-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C52	.001	600	PC-42GM-102	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C53	2.2		PA-4326-1	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	SPARTON PART No.	ABROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	5000		PA-4334-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C55	5000		PA-4334-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C56	5000		PA-4334-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C57	5000		PA-4334-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C58	33	500	MC60E-330			SW5Q33			MS-43	
C59	5000		PA-4334-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C60	5000		PA-4334-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C61	100		HK39M-101	3100	DE-101	GP1K-101	GP1K-101	UC-510	5CA-T1	
C62	1000		PA-4334-5	BPD-001	DD-102	K080	801-001	DC-521	5HK-D1	
C63	1000		HK39M-103	BPD-001	DD-102	K080	801-001	DC-521	5HK-D1	
C64	.022	400	PC42CL-223	P488-022		CUB4S22		PT4122	4TM-S22	
C65	.033	200	PC42GK-333	P488-033		CUB4S33		PT4133	4TM-S33	
C66	.01	400	PC42CL-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C67	.01	400	PC42CL-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C68	.022	600	PC43CM-223	P688-022		CUB6S22		PT6122	6TM-S22	
C69	.22	200	PC-42GK-224	P388-22		CUB4P22		PT4022	4TM-P22	
C70	.0047	600	PC-42GL-472	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C71	220	500	MC-60E-221							
C72	.047	600	PC-42GM-473	P688-047	DF-503	CUB6D47		PT6147	6TM-S47	
C73	.001	600	PC-43GM-102	P688-001	D6-102	CUB6D1	GP2-333-102	PT621	6TM-D1	
C74A	2000							DC-523		
B	5000		♦PA-4339-4	♦PA-110	♦PC-100	♦LB5TM1	♦1405-01	DC-525	♦V-1	
C	5000							DC-525		
C75	.0047	400	PC-42GL-472	P488-0047	D6-472	CUB4D47	GP2-333-472	PT4247	4TM-D47	
C76	.01	400	PC-42GL-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C77	.01	400	PC-42GL-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C78	.0022	600	PC-42GM-222	P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C79	.082	400	PC-42FL-823							
C80	.1	400	PC-42GL-104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C81	.0022	400	PC42GL-332	P488-0022	D6-222	CUB6C22	GP2-333-222	PT6222	6TM-D22	
C82	.0033	400	PC-42GL-222	P688-0033	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C83	1000	500	MC-81E-102	1468-001		1W5D1		MC255	MS-21	
C84	1000	500	MC-81E-102	1468-001		1W5D1		MC255	MS-21	
C85	.01	600	PC-42FM-103	P668-01	D6-103	CUB6S1	GP2-333-103	PT61	6TM-S1	
C86	5100	500	MC-81E-512	1464-005		5R5T51		MCB465	MS-25	
C87	.082	300	PC-42FK-823	P285-082		P2S82		PT4182	2TM-S82	
C88	3900	500	MC-42F-392	1464-004		1R5D39		MCB463	MS-24	
C89	330	500	MC-60F-331	1468-00035		5R5T33		MCB241	MS-33	
C90	470	500	MC-60E-471	1468-0008		5R5T47		MCB245	MS-35	
C91	500	500	MC-60C-820	1468-000075		22R5Q82		MCB230	MS-47	
C92	.01	600	PC-42GM-103	P668-01	D6-103	CUB6S1	GP2-333-103	PT61	6TM-S1	
C93	.047	600	PC-42GM-473	P668-047	DF-503	CUB6S47		PT6147	6TM-S47	
C94	.47	300	PC-42GK-474	P285-5		P2S95		PT405	2TM-P5	
C95	.1	600	PC-42GM-104	P668-1	DF-104	CUB6P1		PT601	6TM-P1	
C96	.047	600	PC-42FM-473	P668-047	DF-503	CUB6S47		PT6147	6TM-S47	
C97	.047	600	PC-42FM-473	P668-047	DF-503	CUB6S47		PT6147	6TM-S47	
C98	.22	400	PC42GL-224	P488-22		CUB4P22		PT4022	4TM-P22	
C99	.0022	1000	PC-42FN-222							
C100	56	2000	PA-4334-5						20GA-Q56	
C101	500	25000	PA-4348							
C102	.001	1000	PC-42GN-102							

♦ Items C74A, C74B, C74C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	PA-4450-5		RTV-472	F1-55	UF16L	Tone-Panel
B	330KΩ	½				R2-38	UR354-774	Volume tapped at 60KΩ-Rear
C	Switch					KB-2	U8-27	Attach to R1B
R2A	50KΩ	½	PA-4467-1		RTV-468	F1-29	UF54L †	Vert. Hold- Panel
B	500KΩ	½				R2-40	UR55L †	Horiz. Hold -Rear
R3A	25KΩ	½	PA-4457-2		RTV-476	F1-37	UF253L †	Brightness-Panel
B	100KΩ	½				R2-31	UR15L †	Contrast-Rear
R4A	2.5Meg	½	PA-4454E	Q11-239	A47-2.5Meg-S	BX-83	U255	Performance
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	2.5Meg	½	PA-4454E	Q11-239	A472.5MegS	BX-83	U255	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	2500Ω	½	PA-4466	Q11-112	A47-2500-S	AB-7	U-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7	500Ω	4	PC-70023-1		A10-500	SVP-985	M500PK	Horiz. Drive Wire wound
B	Shaft		Not Req.		FKS-1/4	Not Req.	Not Req.	Attach to R7A
R8A	100KΩ	½	PA-4471A	Q11-128	A47-100K-S	BX-40	SU-41	Horiz. Set.
B	Shaft		Not Req.	RQ	FKS-1/4	Not Req.	Not Req.	Attach to R8A

† Universal replacement (Mallory exact duplicate Part No. UE-968).
†† Universal replacement (Mallory exact duplicate Part No. UE-812).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	NOTES
R9	10KΩ	½		BTS-10K	
R10	100Ω	½		BTS-100	
R11	22KΩ	½		BTS-22K	
R12	47KΩ	½		BTS-47K	
R13	270KΩ	½		BTS-270K	
R14	180KΩ	½		BTS-180K	
R15	68Ω	½		BTS-680	
R16	15KΩ	½		BTS-15K	
R17	100KΩ	½		BTS-100K	
R18	100KΩ	½		BTS-100K	
R19	100KΩ	½		BTS-100K	
R20	8200Ω	½		BTS-8200	
R21	10KΩ	½		BTS-10K	
R22	33000Ω	1		BTA-3300	
R23	33KΩ	½		BTS-33K	
R24	2700Ω	½		BTS-2700	
R25	10KΩ 5%	½	BR12G-103	BTS-10K 5%	
R26	100Ω	½	BR12N-102	BTS-1000	
R27	100Ω	½	BR12N-101	BTS-100	
R28	47Ω	½		BR12S-470	BTS-47
R29	15KΩ	½		BR12S-153	BTS-15K
R30	470Ω	½		BR12N-471	BTS-470
R31	12KΩ	½		BR12G-123	BTS-12K
R32	100Ω	½		BR12N-101	BTS-100
R33	27KΩ 5%	½		BR12G-273	BTS-27K 5%
R34	3300Ω	½		BR12N-332	BTS-3300
R35	180KΩ	½		BR12S-184	BTS-180K
R36	47Ω	½		BR12S-470	BTS-47
R37	15KΩ	½		BR12S-153	BTS-15K
R38	470Ω	½		BR12N-471	BTS-470
R39	47KΩ 5%	½		BR12G-473	BTS-47K 5%
R40	180Ω	½		BR12S-181	BTS-180
R41	15KΩ	½		BR12S-153	BTS-15K
R42	470Ω	½		BR12N-471	BTS-470
R43	43000Ω 5%	½		BR12G-433	BTS-4300 5%
R44	27Ω	½		BR12S-270	BTS-27
R45	27KΩ	½		BR12S-273	BTS-27K
R46	18000Ω 5%	½		CR12G-182	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	NOTES
R47	3300Ω 5%	2		DR12G-332	
R48	10KΩ	½		BR12S-103	BTS-10K
R49	220KΩ	½		BR12S-224	BTS-220K
R50	470KΩ	½		BR12S-474	BTS-470K
R51	330KΩ	½		BR12S-334	BTS-330K
R52	33KΩ	½		BR12S-333	BTS-33K
R53	47KΩ	½		BR12S-473	BTS-47K
R54	2.2Meg	½		BR12S-225	BTS-2.2Meg
R55	390KΩ	½		BR12N-394	BTS-390K
R56	100KΩ	½		BR12N-104	BTS-100K
R57	100KΩ	½		BR12N-104	BTS-100K
R58	82Ω 5%	½		BR12G-820	BTS-82 5%
R59	22KΩ	½		BR12N-223	BTS-22K
R60	1000Ω	½		BR12N-102	BTS-1000
R61	470KΩ	½		BR12S-474	BTS-470K
R62	22KΩ	½		BR12N-223	BTS-22K
R63	33KΩ	½		BR12S-333	BTS-33K
R64	1000Ω	½		BR12N-102	BTS-1000
R65	220Ω 5%	½		BR12G-221	BTS-220 5%
R66	47KΩ	½		BR12S-473	BTS-47K
R67	10KΩ	½		BR12S-103	BTS-10K
R68	68000Ω 5%	½		BR12G-683	BTS-6800 5%
R69	68000Ω 5%	½		BR12G-683	BTS-6800 5%
R70	6.8Meg	½		BR12N-685	BTS-6.8Meg
R71	10Ω	½		BR12S-100	BTS-10
R72	270KΩ	½		BR12S-274	BTS-270K
R73	470KΩ	½		BR12S-474	BTS-470K
R74	390Ω			CR12S-391	BTA-390
R75	270Ω	½		BR12S-271	BTS-270
R76	1800Ω	½		BR12S-182	BTS-1800
R77	2250Ω			PB40523-2	Note 1
R78	2.2Meg	½		BR12N-225	BTS-2.2Meg
R79	470KΩ	½		BR12S-474	BTS-470K
R80	27KΩ	½		BR12S-273	BTS-27K
R81	100KΩ	½		BR12S-104	BTS-100K
R82	2.2Meg	½		BR12N-225	BTS-2.2Meg
R83	12KΩ	½		BR12S-123	BTS-12K
R84	4.7Meg	½		BR12S-475	BTS-4.7Meg
R85	2700Ω 5%	½		BR12G-272	BTS-2700 5%
R86	1200Ω	½		BR12G-122	BTS-1200
R87	1000Ω	½		BR12G-102	BTS-1000

Note 1. R77, R118, R119, R120 are combined in one unit.

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA SPARTON PART No.	IRC PART No.	NOTES
R88	15KΩ	½		BR12S-153	BTS-15K
R89	8200Ω	½		BR12S-822	BTS-8200
R90	8200Ω	½		BR12S-822	BTS-8200
R91	470KΩ	½		BT12S-474	BTS-470K
R92	22KΩ	½		BR12S-223	BTS-22K
R93	100KΩ	½		BR12S-104	BTS-100K
R94	100KΩ	1		CR12S-104	BTA-100K
R95	100KΩ	1		CR12S-104	BTA-100K
R96	8200Ω 5%	½		BR12G-822	BTS-8200 5%
R97	2.2Meg	½		BR12N-225	BTS-2.2Meg
R98	5600Ω	½		BR12S-561	BTS-560
R99	68KΩ	1		CR12S-683	BTA-68K
R100	330KΩ	½		BR12S-334	BTS-330K
R101	27KΩ	½		BR12S-273	BTS-27K
R102	560Ω	½		BR12S-561	BTS-560
R103	560Ω	½		BR12S-561	BTS-560
R104	100KΩ 5%	½		BR12G-104	BTS-100K 5%
R105	100KΩ 5%	½		BR12G-104	BTS-100K 5%
R106	4.7Meg	½		BR12N-475	BTS-4.7Meg
R107	470KΩ	½		BR12S-474	BTS-470K
R108	15000Ω 5%	½		BR12G-153	BTS-1500 5%
R109	82000Ω 5%	½		CR12G-823	BTA-8200 5%
R110	22KΩ	½		BR12S-223	BTS-22K
R111	180KΩ 5%	½		BR12G-184	BTS-180K 5%
R112	10KΩ	½		BR12S-103	BTS-10K
R113	12KΩ	2		DR12S-123	BTB-12K
R114	12KΩ	3		DR12S-123	BTB-12K
R115	12KΩ	3		DR12S-123	BTB-12K
R116	1 Meg	½		BR12S-105	BTS-1 Meg
R117	100Ω	½		BR12N-101	BTS-100
R118	150Ω	5		PB40523-2	Note 1
R119	7500Ω	5		PB40523-2	Note 1
R120	4000Ω	5		PB40523-2	Note 1
R121	1000Ω	½		BR12N-102	BTS-1000
R122	5.1	½		BRW12S-51	
R123	470Ω	½		CR11N-474	BTA-470K
R124	2700Ω	2		DR12S-272	BTB-2700
R125	2.2Meg	½		BR12S-225	BTS-2.2Meg
R126	1200Ω	1		CR12S-122	BTA-1200
R127	220KΩ	½			BTS-220K

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA SPARTON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ L 96A	596VCT .180ADC	370VCT .100ADC	AB-44038-1						
	SEC. 3	SEC. 4	SEC. 5							
	5VAC @ 3A	5VAC @ 2A	6.3VAC @ 1.2A							
	SEC. 6									
	12.3VAC @ 0.1A									

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA SPARTON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Vert. Osc. Trans.	AB47014-1	A-8111	A-3000	A-95X	209T1	B6700	24A87
T3	Horiz.Output Trans.	PC70025		HV0-9 & MVC-1①	D-35 * ①	232T1 *①	FB41 & RF800①	FLY-14 & WC-20*①
T4	Vert.Output Trans.	AB44071-1	A-8115	A-3035	A-101U	204T2	21800	24B86
T5A	Yoke-Horiz. (10MH)	AB43070-3	DY-2A	MDF-70	Y-21-1	206DI②	DF601	Y-6 ②
B	Vert. (41MH)							
T6	Horiz. Lin. Coil (.5-8MH)	AA6400-6		MWC-6③	WC-12③④	213R1 ④	RF800③④	WC-17③④
T7	Width Coil (.3-2.8MH)	AA6400-7		MWC-7 ③	WC-13③⑦	206R1 ④		WC-18③④

① Drill new mounting holes.
② Use original yoke network.
③ Drill new mounting hole or use original slider and core.
④ Connect to coded blue and green terminals.
⑤ Connect to terminals #3 and #4.
⑥ Do not use tap.
⑦ Connect to coded red and green terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
6B		NC	NC	NC	NC	NC
4B		9	10	10	9	9
3B		9	10	10	9	9
9B		8	8	8	8	7 & 8
10A		5	6	6	5	4
5A		7	4	4	4	7
4A		MWC-1 Red Term.	2	2	RF800 Term #2	WC-20 Term #4
3A		MWC-1 Blue Term.	1	1	RF800 Term. #1	WC-20 Term #3

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION-DATA (cont)

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
Connect Width Coil Across →			MWC-1 Orange & Black Term 3 & 1			RF800 Term #3 & #4 "T" & 3	WC-20 Terms # 1 #2 "T" & 3
Special Notes →			⑤ ⑦	⑥		① ②	③ ⑦

② If the picture is out of phase, reverse primary or secondary connections to width coil.
③ Remove original width coil,resistor R120, capacitors C99 and C102 from circuit.
⑦ Connect jumper from terminals #9 to terminal "T".

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA SPARTON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T8	5.1KΩ	3.3Ω	AB44066-4	A-3849	A-3019	S-5Z	Z1002	28849	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP.	REPLACEMENT DATA SPARTON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.3Ω	PC-83000430	6J4	6A1	① Alternate 6" PM speaker
				PC-83000-531			② Used in model 12A210
	10"	PM	3.3Ω	PC-83000-50③	10J11	10A31	③ Used in model 14A204
	12"	PM	3.3Ω	PC-83000-53③	12J11	12A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SPARTON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3	UHF Ant. Mixer, Osc. Coils	0Ω						
L4	RF Choke	0Ω						
L5	Fil. Choke	0Ω						
L6	Cathode Choke	0Ω						
L7	UHF Inter-stage IF Coil	.1Ω	.3Ω					
L8	UHF Inter-stage IF Coil	.1Ω	.3Ω					
L9	UHF Inter-stage IF Coil		.2Ω					
L10	VHF Ant. Coil	0Ω CT	0 Ω					
L11	Neut. Coil	0Ω						
L12	RF, Mixer Grid & Osc. Coils	0Ω						
L13	Fil. Choke	0Ω						
L14	Conv. Plate Coil	0Ω						
L15	1st Video IF	.1Ω		AB43095-1			6322 *	Includes 41.25MC Trap
L16	2nd Video IF	.2Ω	.2Ω	AB43095-2	17-4531 †		6323	Includes 41.25MC Trap
L17	3rd Video IF	.2Ω	.2Ω	AB43095-3	17-4504		6323	Includes 47.25MC Trap
L18	4th Video IF	.3Ω	.3Ω	AA6833-1				Includes crystal (1N54/1N60), series peaking coil, & a 6.8 MMF cap.
L19	Series Peaking Coil	8.5Ω		AA6403-8	19-3100 ■		6153 ■	110 Microhenries; wound on 5.8KΩ resistor
L20	Shunt Peaking Coil	26Ω		AA6613-8	19-3660	TV-188	4650	800 Microhenries
L21	Series Peaking Coil	9Ω		AA6403-7	19-4200	TV-184 ■	6154 ■	213 Microhenries; wound on 6.8KΩ resistor
L22	4.5MC Trap	1.7Ω		AA6407-1	20-1004	TV-151	1470	
L23	Shunt Peaking Coil	13Ω		AA6613-10	19-1923	TV-188	4646	430 Microhenries
L24	1st Sound IF	4.2Ω		AB43080-4				
L25	2nd Sound IF	2.1Ω	2.1Ω	AB43080-5	16-3445 ▲	TV-113	6303	
L26	Ratio Det.	7Ω	1.4ΩCT	AB43080-6	17-3497	TV-115	6305	Tertiary winding-.5Ω
L27	Horiz. Osc.	62Ω		AA6403-2	19-1576	TV-163	6310	
L28	RF Choke	.6Ω		AA6650-8	19-1003		4608	3.2 Microhenries
L29	RF Choke	.8Ω		AA6650-8	19-1003		4608	3.2 Microhenries

* Use one winding only.
■ Parallel with 6.8KΩ resistor.
▲ Drill mounting hole.
† Drill mounting holes and retune.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA SPARTON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L30	160A	11Ω	5HY	AB-47009-3	C-2304 ①		C-13X ①	CS026 ①	
L31	100A	11Ω	5HY	AB-47009-3	C-2304 ①		C-13X ①	CS026 ①	

① Drill one new mounting hole.

SPARTON
MODELS 11T210, 12A204, 12A210, 14A204 (Ch. 23U214)

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SPARTON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	3/8A 250V			312. 375 (3/8A-3AG)	121004 (2 used)	AGC 3/8	4440 (2 used)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		SPARTON PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M2	1N82A		1N82, 18N2A	1N72A	UHF Mixer
M3	1N64 or 1N60		1N60, 1N132	1N60, 1N64A	Video Det.

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M4	Dial Light		#47, Bayonet
M5	Tuner		VHF-UHF
M6	Trap		VHF Antennna Input Filter
M7	Focus Magnet	PC70027-1	Includes centering device
M8	Ion Trap	PA1248-6	
	Cabinet	PD90170-2	Mahogany - Model 11T210
	Cabinet	PD90171-2	Mahogany - Models 12A204, 12A210
	Cabinet	PD90173-2	Mahogany - Model 14A204
	Knob	PA5660-3	Horiz. Hold, contrast & tone - Model 11T210
	Knob	PA5669-1	Vert. Hold (Maroon) - All Models
	Knob	PA5670-1	Brightness (Maroon) - All Models
	Knob	PA5671-1	On/off/volume (maroon) - All Models
	Knob	PB40616-1	VHF channel selector (maroon) - All Models
	Knob	PB40618	UHF channel selector (maroon) - All Models
	Knob	PB40617	Fine tining - All Models
	Knob	PA5660-1	Horiz. Hold, contrast & tone (Maroon) - Models 12A204, 12A210, 14A204
	Mask	PE97003	All models
	Safety Glass	PB40628-1	Tinted - Model 14A204
	Safety Glass	PB40625-1	Tempered - Models 12A204, 12A210, 11T210

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check by substitution V22 and V23. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check by substitution V22 and V23. Check B+ filter and decoupling network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V18, V19, V20 and V21. Check M1 fuse. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, C96, C97, C98, C93, R119, L28, L29 and other associated components.	Check L27, C88, C89, C92, R111, R109, R116 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21 and V23. Check adjustments R7, B2 and B3. Check C92, C93, R119, T3, T5A and other associated components.

BLOOMING

Check by substitution V19, V20, V21 and V23. Check R118, R7, C94, T3, T5A and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V2, V3, V4, V5, V6, V7 and V8. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

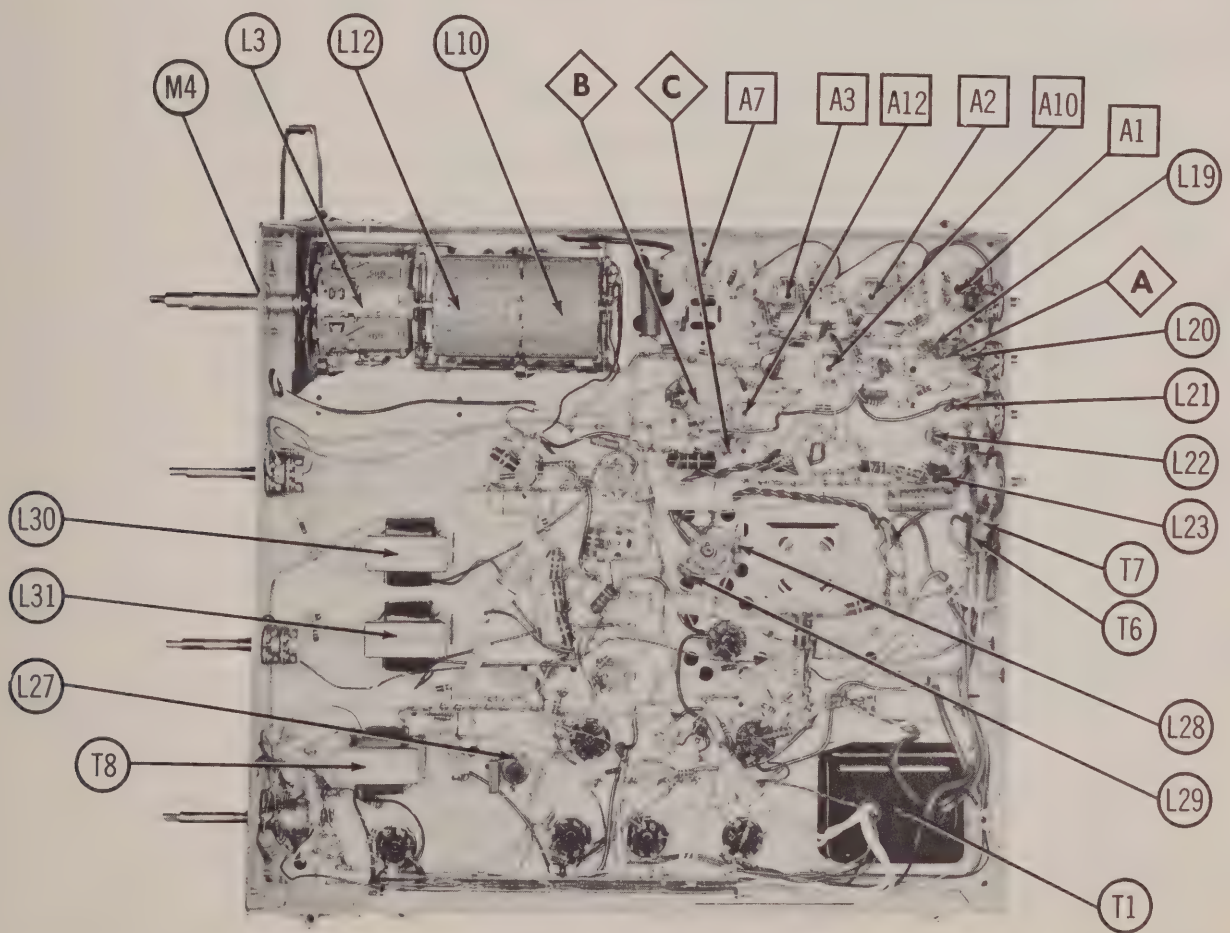
KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator circuit may be accomplished as follows:

1. Set the selector knob to VHF position.
2. Tune in a TV station and set the fine tuning control to the center of its range.
3. Remove the channel selector and fine tuning knobs.
4. Adjustments are accessible one at a time then the small hole above and slightly to the left of the channel switch shaft.

To adjust the UHF oscillator set the channel selector knobs to the desired UHF channel. The fine tuning knob should be at the cnter of its range. Remove knobs and adjust the oscillator slug, thru the same hole as for VHF adjustments.

If two UHF channels are received and use the same UHF coil strips, the oscillator should be set for the channel closest to the center of the group.

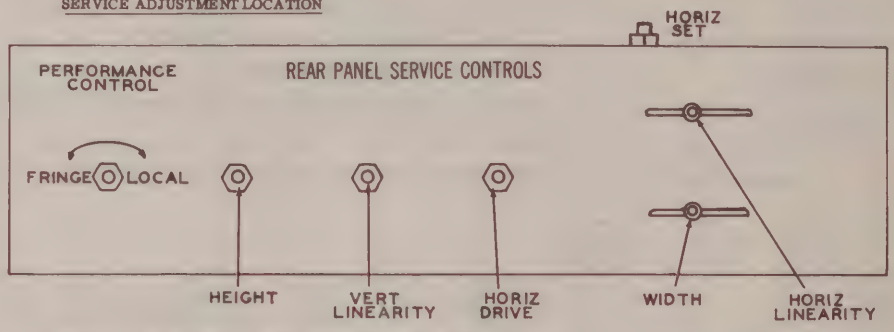
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove three (3) metal screws holding decorative molding. Remove molding and slide safety glass down and out. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

Remove safety glass. Remove 2 bolts from front tube mounting. Remove rear cover, tube socket, ion trap and HV lead. Remove picture tube.

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - PEAK PERFORMANCE CONTROL

Set the peak performance control (R4A) to its fully counter clockwise position. Tune in the strongest TV station available. Turn the contrast control fully clockwise. If picture appears normal leave R4A in its fringe position (fully CCW). If signs of overload are noted turn R4A in a clockwise direction until a normal picture is obtained. Do not turn R4A further clockwise than necessary to obtain normal picture.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (L27) until, picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF detector buzz, adjust the ratio detector secondary (L26) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

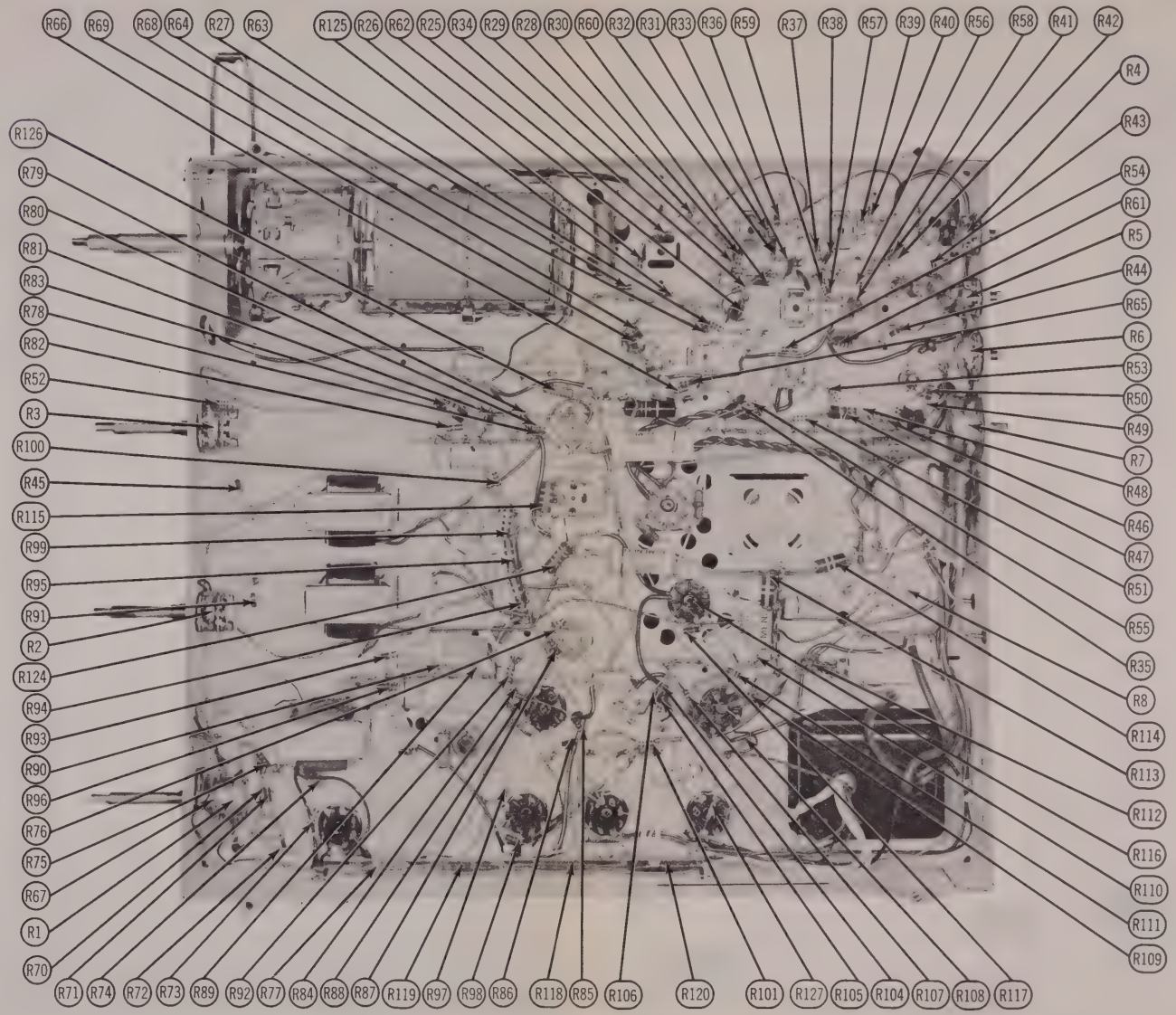
CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

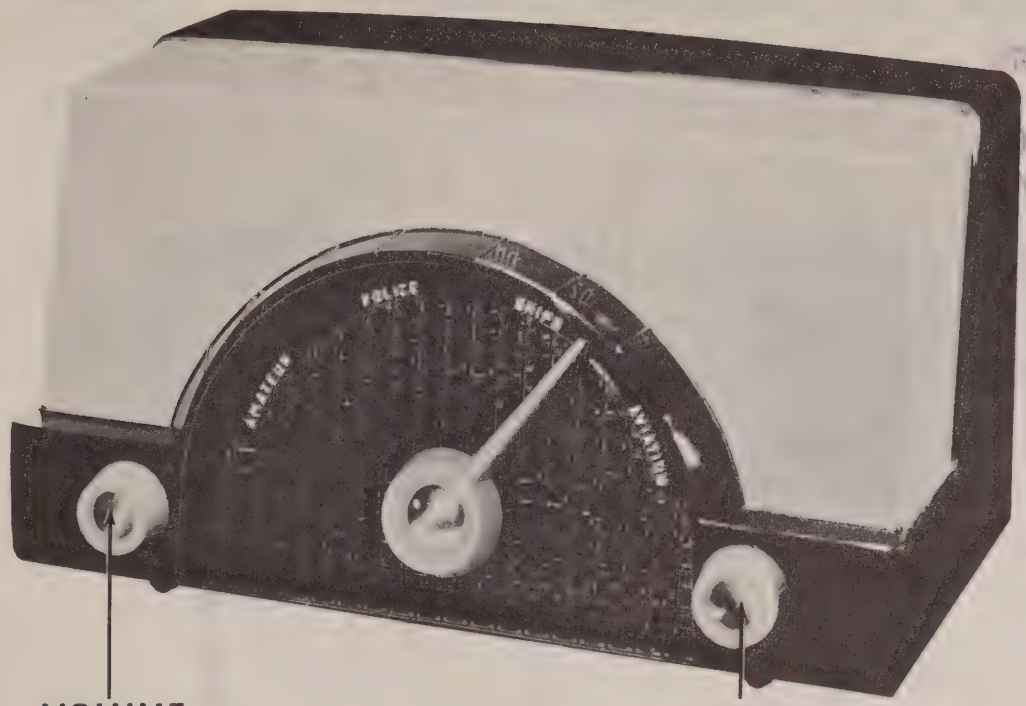
1. Remove 9 push-on type control knobs from front panel.
2. Remove 8 metal screws. Remove rear cover.
3. Disconnect 2 speaker leads. Remove 2 speaker nuts. Remove speaker.
4. Disconnect built-in antenna.
4. Remove 2 metal screws. Remove antenna bracket.
5. Remove 4 chassis bolts. Remove chassis.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
BLANKENSHIP
924 GRADE ST
NVER, COLORADO



VOLUME CONTROL ON-OFF SWITCH

TUNING CONTROL

STEWART-WARNER
MODELS 9182-C, -H, -J

STEWART-WARNER
MODELS 9182-C, -H, -J

TRADE NAME	Stewart-Warner Models 9182-C, -H, -J
MANUFACTURER	Stewart-Warner Elect., Div. of Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 15, Ill.
TYPE SET	AC-DC Operated 2 Band AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC — SHORT WAVE 1.8 - 3MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

With tuning gang fully closed, set dial pointer approximately 1/4 inch to left of "55" on the dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400%Mod)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to external antenna lead. Low side to B-.	1650KC	"	"	"	A5	"
3.	"	"	1500KC	"	Tune to 1500KC signal	"	A6	"
4.	400Ω Carbon Resistor	"	3MC	SW	Tune to 3MC signal	"	A7	"
5.	"	"	1.8MC	"	Tune to 1.8MC signal	"		If 1.8MC signal cannot be tuned in repeat steps 2 thru 5.

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PARTS LIST AND DESCRIPTIONS

STEWART-WARNER
MODEL 9182-C

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Stewart-Warner PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Stewart-Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	521763	PRS150/50-30		BBRD5315		TCD497	TVA-2450	Blue
B	30	150								Red
C2	944		512548							
C3	.47		513002	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C4	5		513401							
C5	.02	400	512208	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C6	.02	400	512208	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C7A	220									
B	2000									
C	5000		♦509836	♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦DT-1	
D	250									
E										
C8	.02	400	512208	P488-02	DF-203	CUB4S2		PT412	4TM-S2	
C9	.05	400	512041	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C10	.15	400	512029	P488-15		CUB4P15		PT4015	4TM-P15	

♦ Items C7A, C7B, C7C, C7D, C7E, R6A, R6B and R6C are combined in one unit.
When replacing items individually items C7D and C7E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stewart-Warner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	520118	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart-Warner PART No.	IRC PART No.	
R2	22KΩ	½	5101 61	BTS-22K	
R3	100KΩ	½	510173		
R4	100Ω	½	510119	BTS-100	
R5	2.2Meg	½	510193	BTS-2.2Meg	

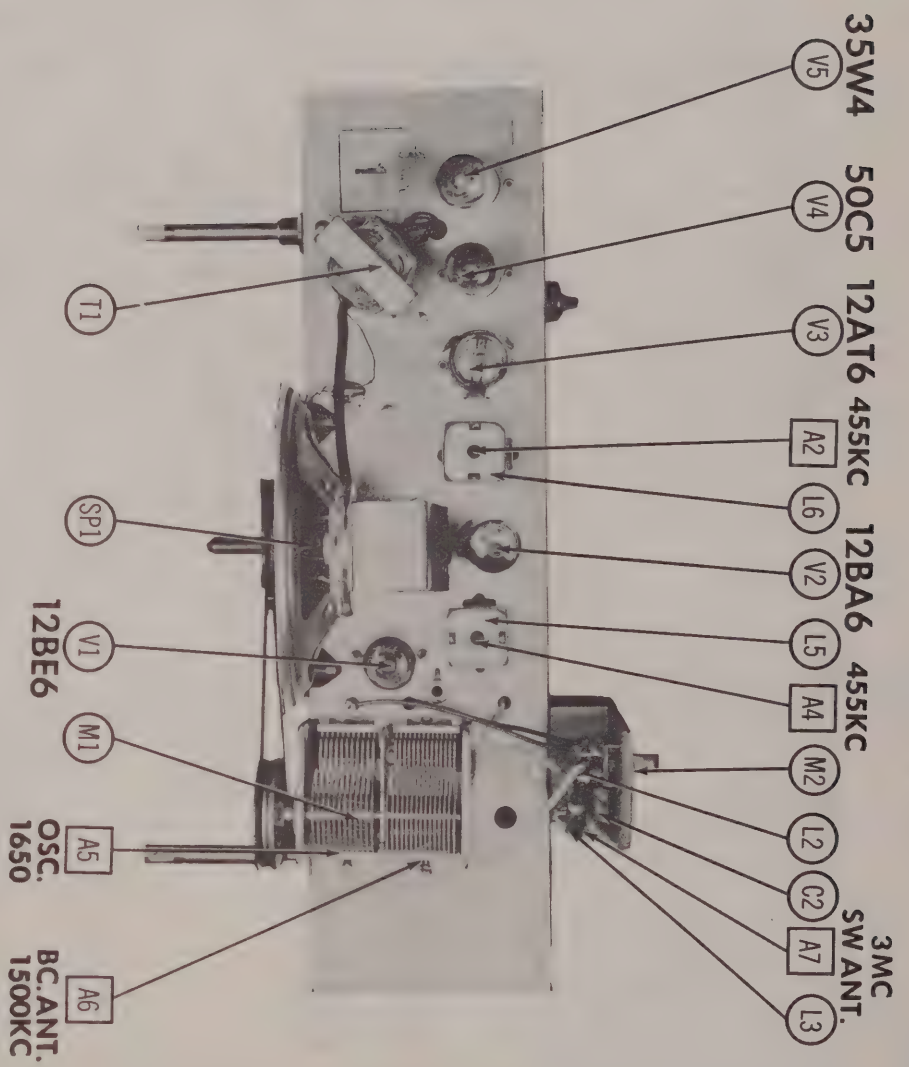
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Stewart-Warner PART No.	IRC PART No.	
R6A	6.8Meg	½	♦509836	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R7	150Ω	½	510122	BTS-150	
R8	1000Ω	1	510237	BTA-1000	

♦ Items R6A, R6B, R6C, C7A, C7B, C7C, C7D, C7E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Stewart-Warner PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.9Ω	521779	A-3330 ①	A-3031 ①		Z1102 ①	24S50 ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

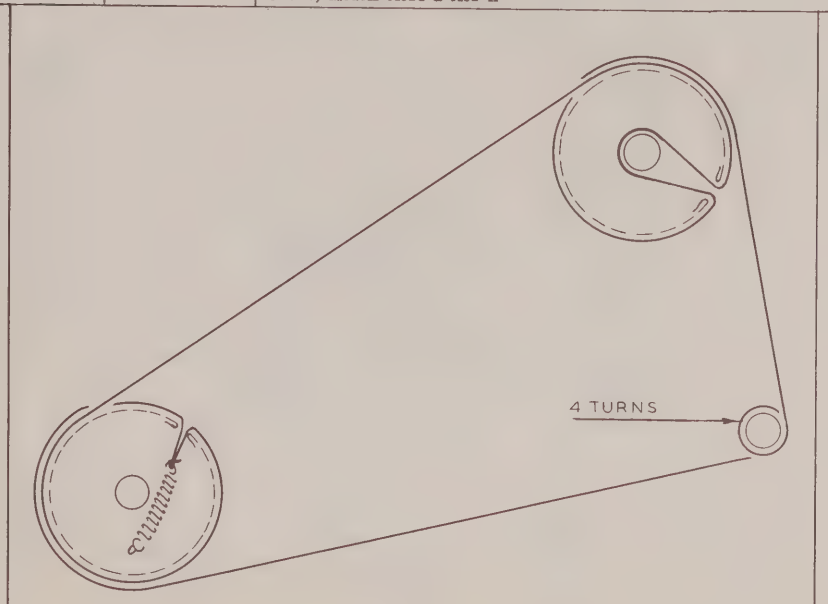
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Stewart-Warner PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.9Ω	509828	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Stewart-Warner PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	1.8Ω		521769				
L2	Sw. Ant. Coil	1.6Ω		521659	19-6022		4626	
L3	Sw. Osc. Coil	2.9Ω		521754	19-3036	TV-180	6176	
L4	BC Osc. Coil	.7Ω	6.5Ω	521756	14-1074	BC-381	71-Osc.	
L5	Input IF	17Ω	17Ω	509433	16-6758	BC-352	12-C1	
L6	Output IF	17Ω	17Ω	509433	16-6758	BC-353	12-C2	

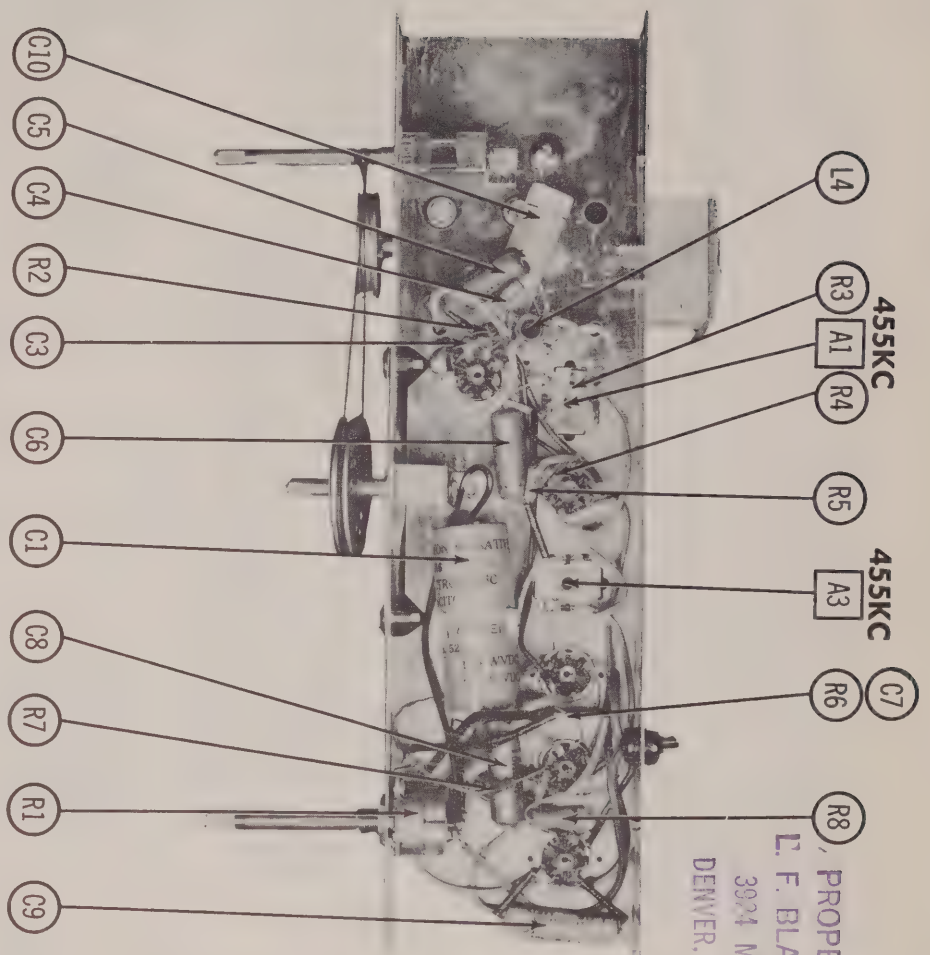
MISCELLANEOUS

ITEM No.	PART NAME	Stewart-Warner PART No.	NOTES
M1	Tuning Cap.	521799	24-500MMF, 19-165MMF
M2	Switch	521655	Band
	Cabinet	521904	Gray-yellow - Model 9182-C
	Cabinet	521902	Black, Model 9182-H
	Cabinet	521903	Black-Red, Model 9182-J
	Knob	521897	Tuning, off/on/volume, Red, Model 9182-J
	Knob	521896	Tuning, off/on/volume, yellow, Model 9182C & 9182-H
	Pointer	521898	Red, Model 9182-J
	Pointer	521899	Yellow, Models 9182C & 9182-H



DRIVE CORD STRINGING

CHASSIS—BOTTOM VIEW



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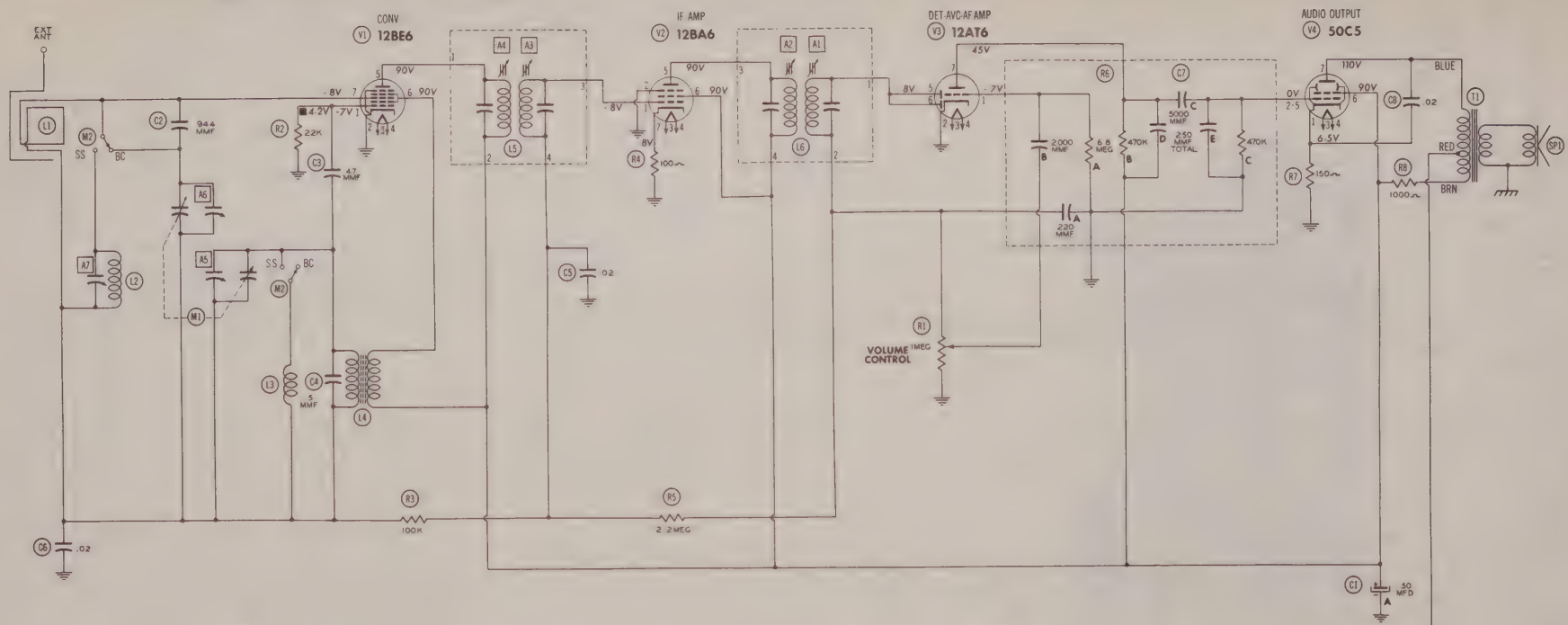
DENVER, COLORADO

STEWART-WARNER
MODEL 9182-C

STEWART-WARNER
MODEL 9182-C



IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	0Ω	25Ω	14Ω	†1.2KΩ	†1.2KΩ	3.3Meg
V 2	12BA6	3.2Meg	0Ω	25Ω	36Ω	†1.2KΩ	†1.2KΩ	100Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	14Ω	1Meg	1Meg	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	90Ω	470KΩ	†1KΩ	†217Ω
V 5	35W4	INF	†1KΩ	90Ω	130Ω	130Ω	120Ω	120KΩ

■ READING TAKEN IN SPECIAL SERVICE POSITION
† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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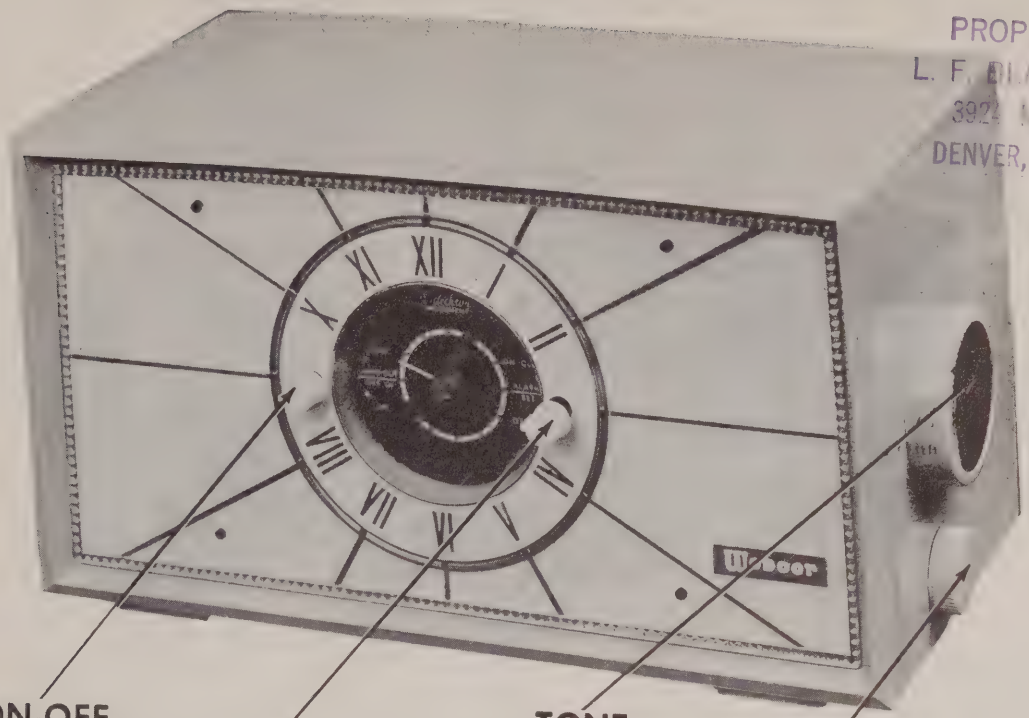

WEBCOR
MODEL D-300-1

TRADE NAME	Webcor Model D-300-1
MANUFACTURER	Webster Chicago, 5610 Bloomingdale Ave., Chicago 39, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

WEBCOR MODEL D-300-1

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		WEBCOR PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	WEBCOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150		PRS150/50-30		BBRD-5315		TCD497	TVA-2450	Blue
B	30	150								Red
C2	.05	200		P288-05	DF-502	PJ2S5		PT415	2TM-S5	
C3	.05	200		P288-05	DF-502	PJ2S5		PT415	2TM-S5	
C4	100			S1100	D6-101	TP29	GP1K-101	UC-531	5GA-T1	
C5	.065	600		P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C6A	5000									
B	250			♦PA-112-2	♦PC-71	♦112TM2	♦1406-02		♦T-4	
C										
C7	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C8	.05	400		489ZX-05	DF-503	CUB4S5		PT415	4TM-S5	
C9	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C10	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	

♦ Items C6A, C6B, C6C, R7A, R7B are combined in one unit.
When replacing items separtely items C6B and C6C should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	WEBCOR PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg with 50KΩ stop	½	N-9943	Q13-137	A47-1Meg-Z	BSK-70	U-53	Volume-See Note
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A

Note: Connect a 47KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).

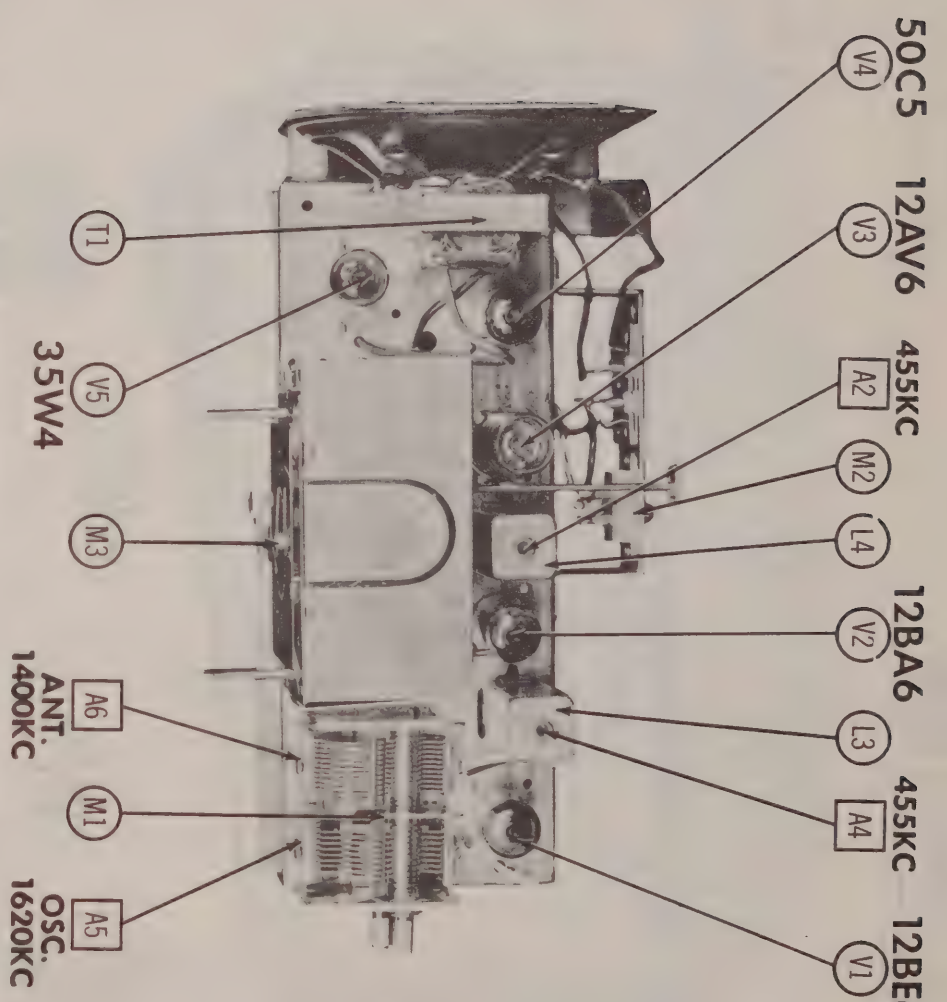
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	82Ω	½		BTS-82	
R4	2.2Meg	½		BTS-2.2Meg	
R5	47KΩ	½		BTS-47K	
R6	6.8Meg	½		BTS-6.8Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	WEBCOR PART No.	IRC PART No.	
R7A	250KΩ	½	♦		
B	500KΩ	½			
R8	180Ω	½		BTS-180	
R9	1200Ω	1		BTA-1200	
R10	33Ω	1			

♦ Items R7A, R7B, C6A, C6B, C6C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA WEBCOR PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3Ω	Part of speaker	A-3332 ①	A-3025 ①	S-12X ①	Z1101 ①		① Bend mounting tabs down, file out slots. Mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA WEBCOR PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3Ω	N9962	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

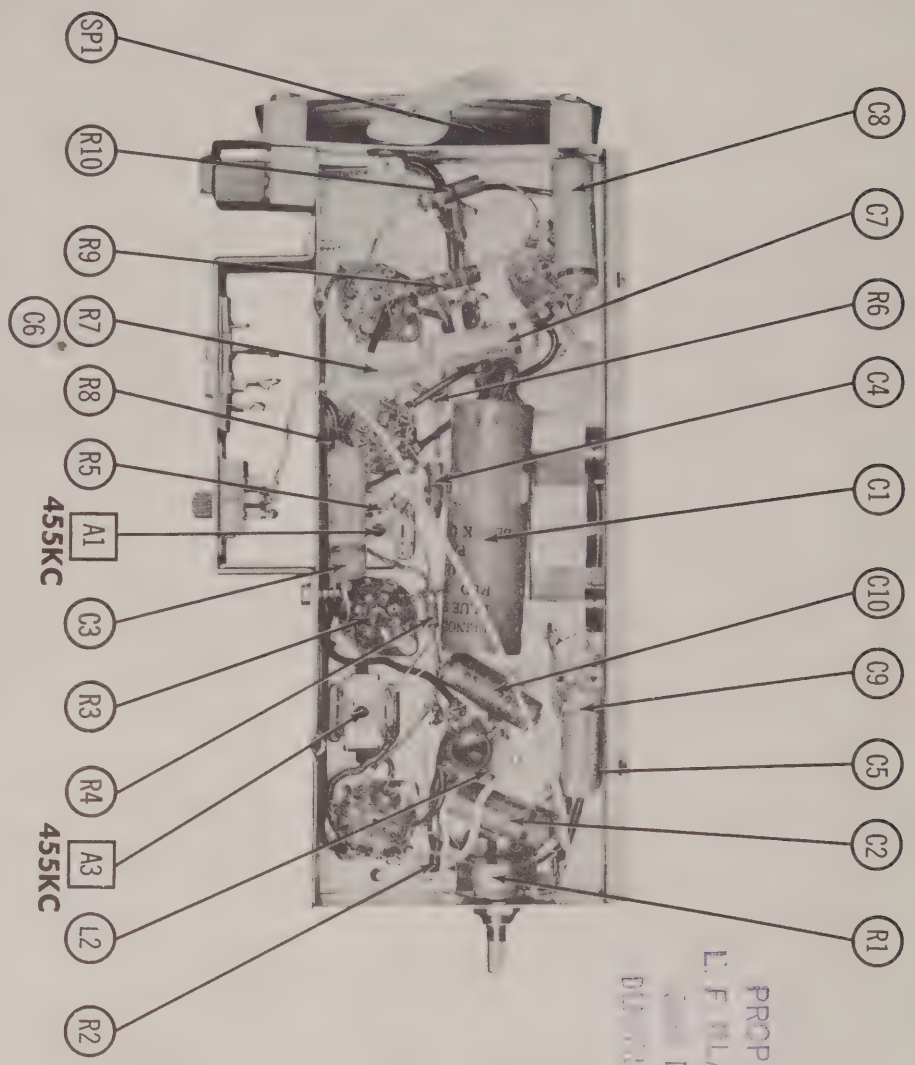
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA WEBCOR PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	.4Ω						Includes cabinet back
L2	Osc. Coil	.5Ω	7.5Ω		14-1073		69-Osc. †	
L3	Input IF	13Ω	13Ω	7981	16-6758	BC-352	12-C1	
L4	Output IF	13Ω	13Ω	7981	16-6758	BC-353	12-C2	

† Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	WEBCOR PART No.	NOTES
M1	Tuning Cap.	N-6675	(44-405 & 17-125MMF)
M2	Switch	N-8099	Radio-Phono
M3	Clock		

CHASSIS—BOTTOM VIEW



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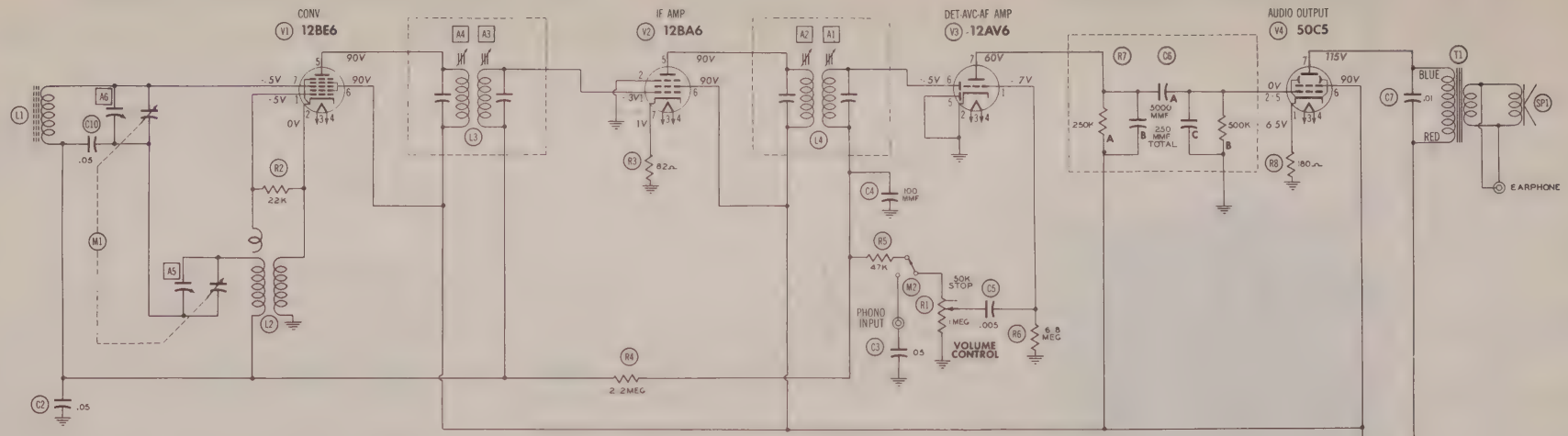
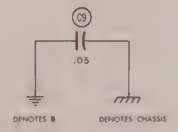
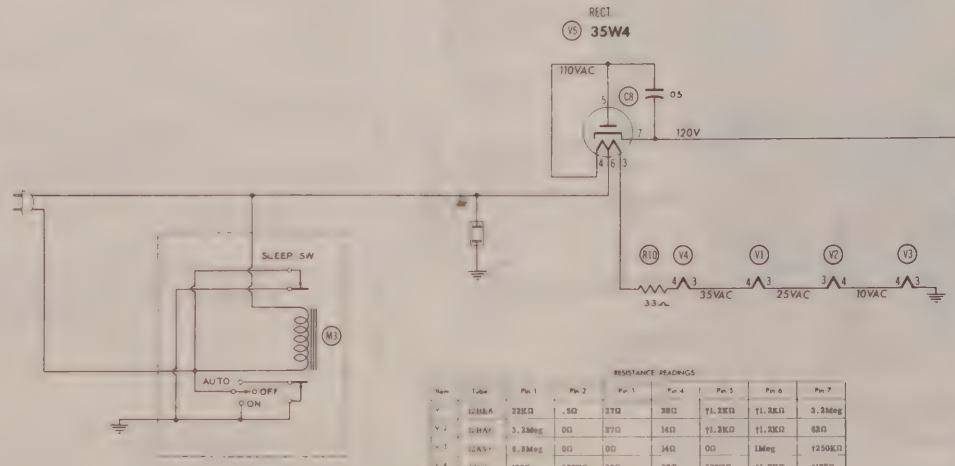


IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE





RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22KΩ	.5Ω	27Ω	38Ω	†1.2KΩ	†1.2KΩ	3.2Meg
V2	12BA6	3.2Meg	0Ω	27Ω	14Ω	†1.2KΩ	†1.2KΩ	68Ω
V3	12AV6	6.8Meg	0Ω	0Ω	14Ω	0Ω	1Meg	†250KΩ
V4	50C5	180Ω	500KΩ	36Ω	82Ω	500KΩ	†1.2KΩ	†182Ω
V5	35W4	INF	INF	115Ω	140Ω	140Ω	135Ω	100KΩ

† MEASURED FROM PIN 7 OF V3

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)

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WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)

MODEL H-799T17

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DATE 10–54 SET 255 FOLDER 17

WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)

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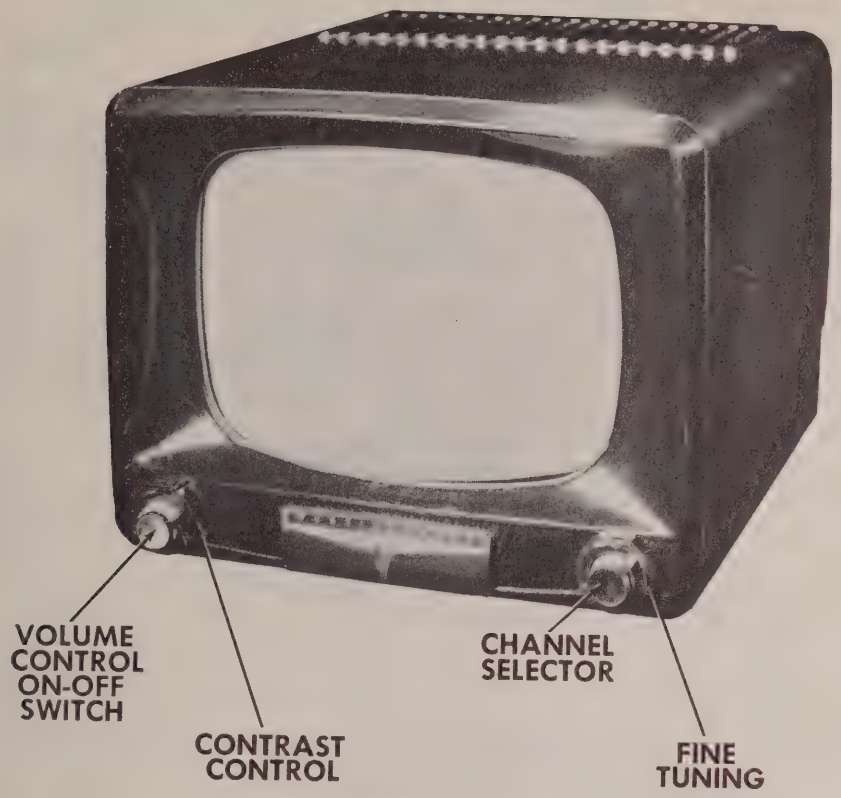

WESTINGHOUSE MODEL H-799T17

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-798T17, H-799T17	V-2260-12 or V-2260-14
		H-798TU17, H-799TU17	V-2270-122 or V-2270-124
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Division, Metuchen, N.J.		
TYPE SET	Television Receiver		
TUBES	Eighteen		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 1.84 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)

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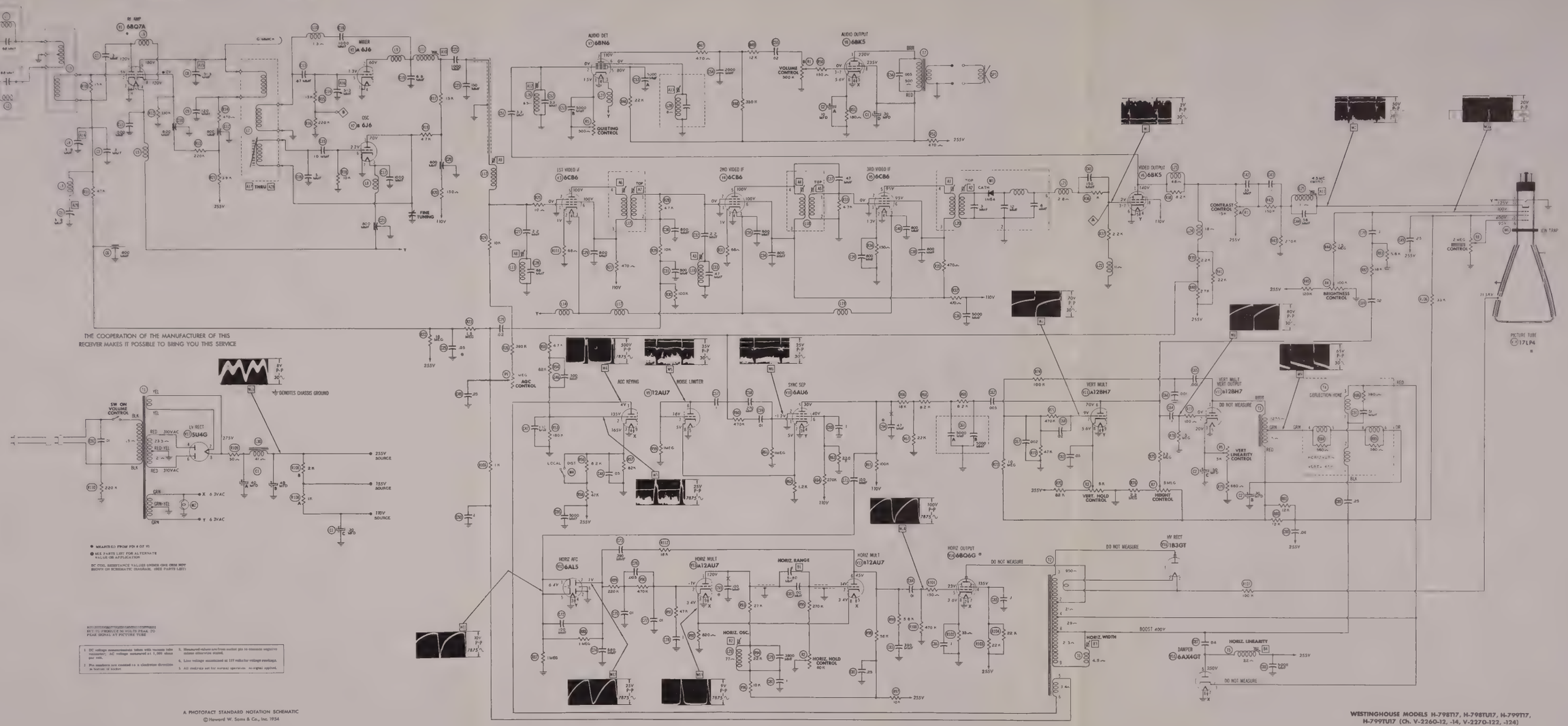
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
RF AMP 6BQ7A
MIXER 6J6
OSC 6J6
AUDIO DET 6BN6
AUDIO OUTPUT 6BK5
VOLUME CONTROL 500 K
QUIETING CONTROL
1ST VIDEO IF 6CB6
2ND VIDEO IF 6CB6
3RD VIDEO IF 6CB6
VIDEO OUTPUT 6BK5
CONTRAST CONTROL 5K
BRIGHTNESS CONTROL
PICTURE TUBE 17LP4
ACC CONTROL
ACC KEYING 12AU7
NOISE LIMITER
SYNC SEP 6AU6
VERT MULT 12BH7
VERT MULT VERT OUTPUT 12BH7
VERT LINEARITY CONTROL 5K
VERT. HOLD CONTROL
HEIGHT CONTROL
DEFLECTION YOKE
HORIZ AFC 6AL5
HORIZ MULT 12AU7
HORIZ. RANGE
HORIZ. OSC.
HORIZ. HOLD CONTROL 60 K
HORIZ MULT 12AU7
HORIZ OUTPUT 6BQ6G
HV RECT 1B3GT
DO NOT MEASURE
BOOST 400V
HORIZ. WIDTH
HORIZ. LINEARITY
DAMPER 6AX4GT
SW ON VOLUME CONTROL
LV RECT 5U4G
255V SOURCE
155V SOURCE
110V SOURCE
6.3VAC
6.3VAC
MEASURED FROM PIN 8 OF V1
SEE PARTS LIST FOR ALTERNATE VALUES OR APPLICATION
DC COIL RESISTANCE VALUES UNLESS ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM. (SEE PARTS LIST)
SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured on 1,000 ohms per volt meter.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation as signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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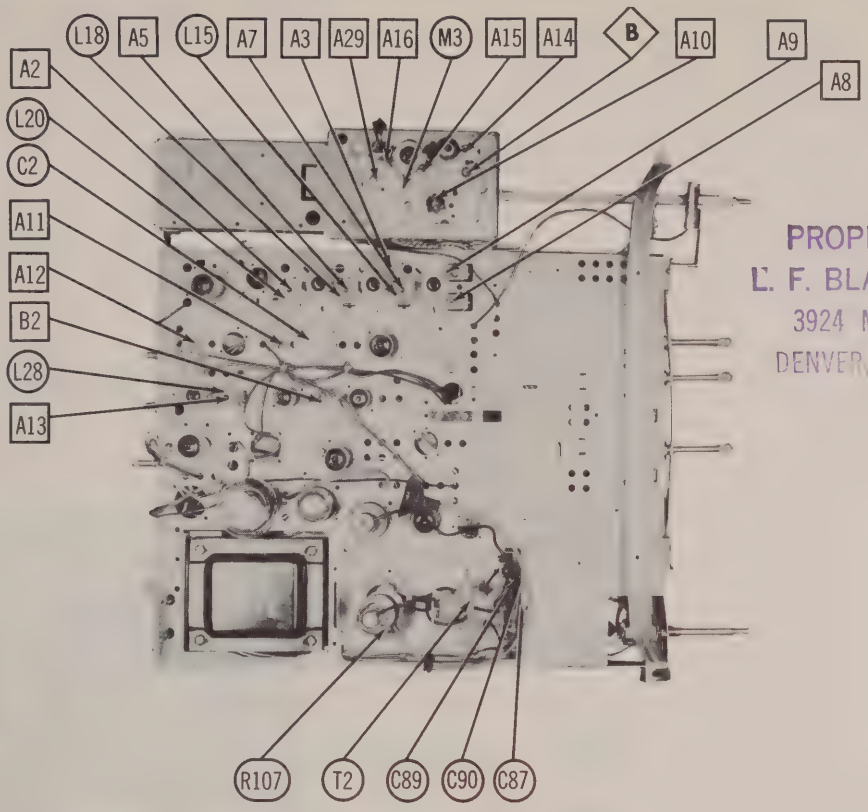
WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)



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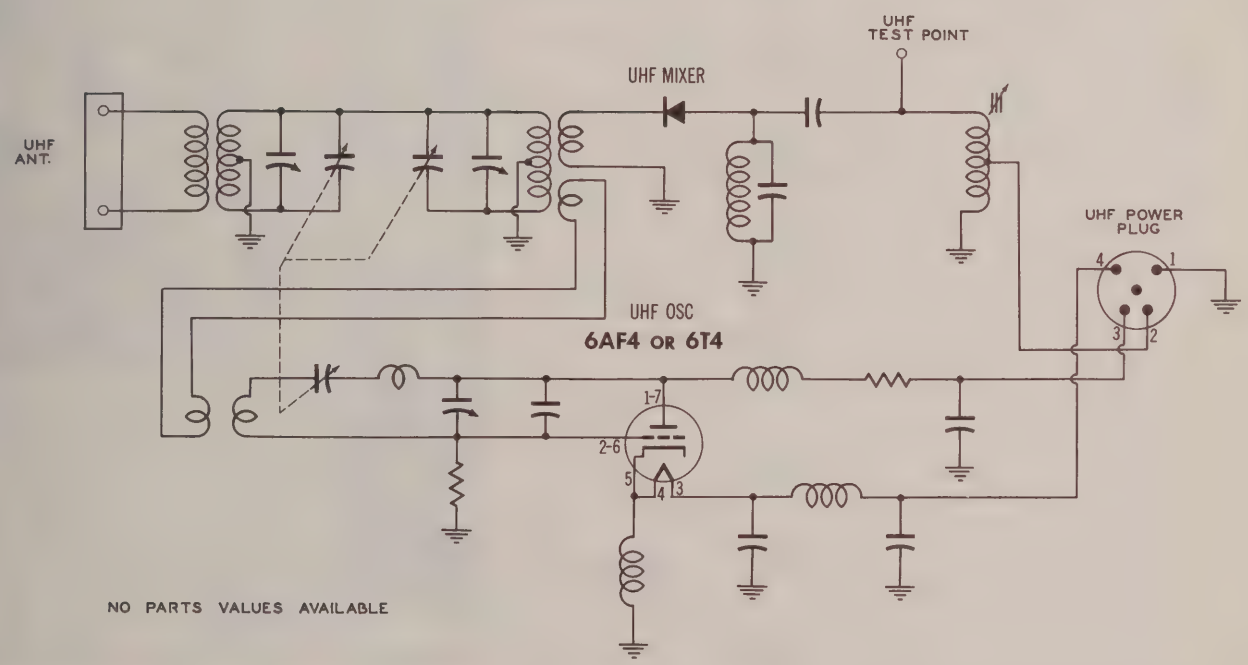
CHASSIS TOP VIEW



UHF TUNER USED WITH VHF TUNER PART NO. V-12400-1

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UHF TUNER SCHEMATIC

SET 255 FOLDER 17

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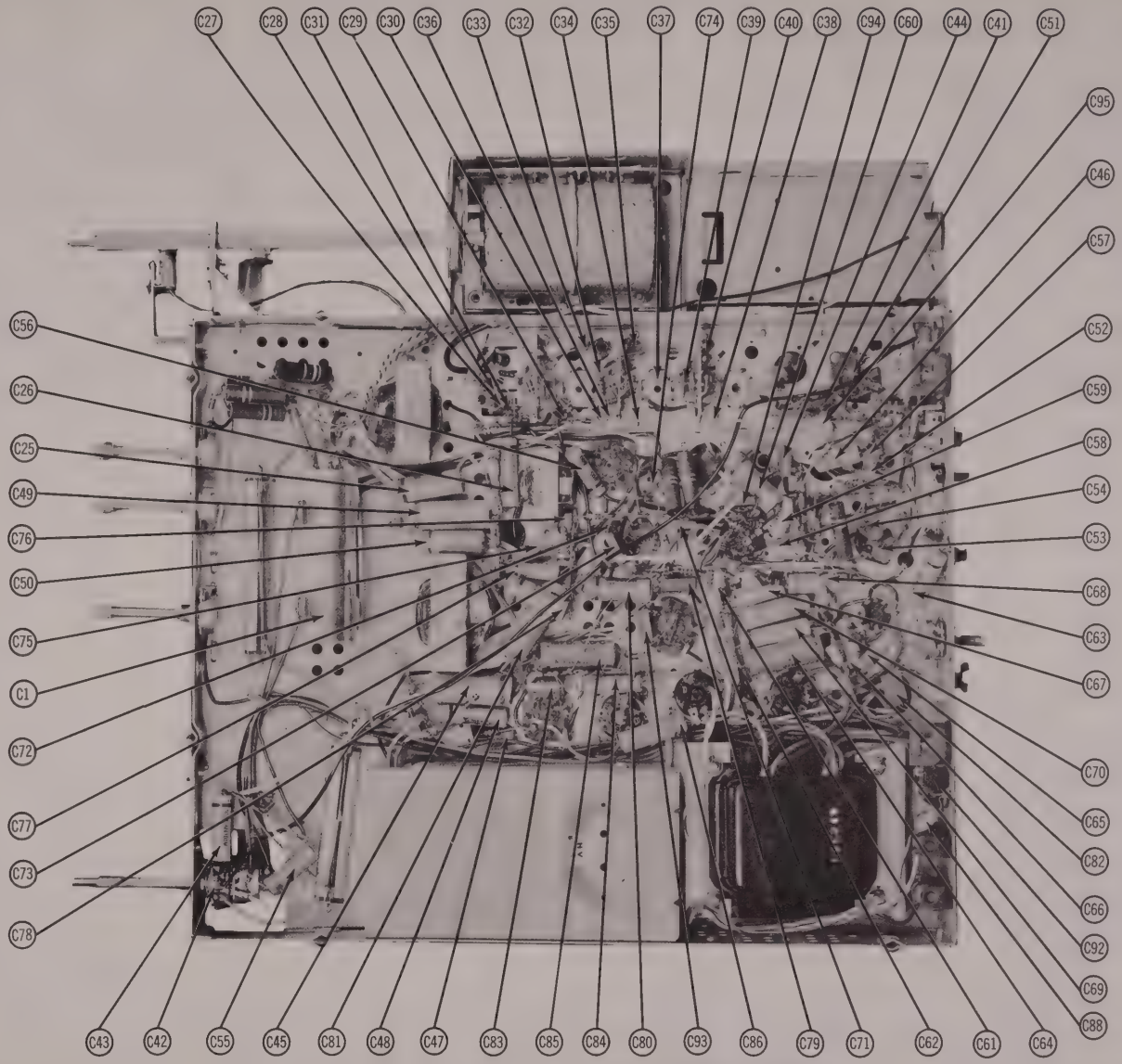

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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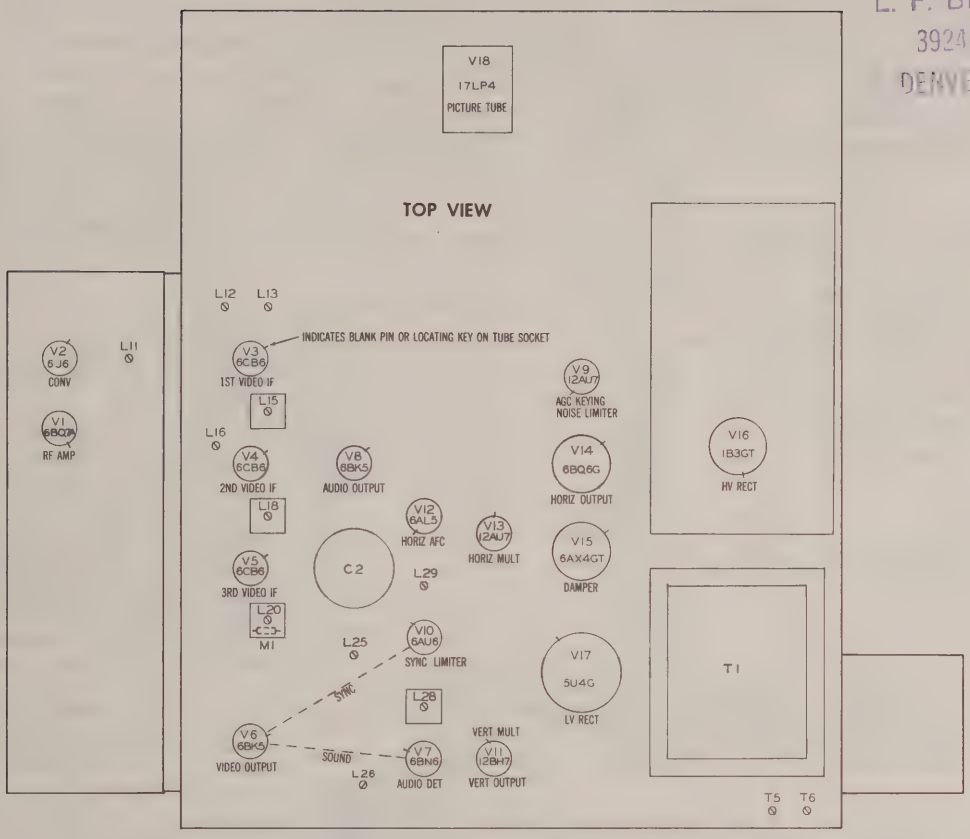

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V8, V18
Has pic, no sound - V7, V8
Overloaded picture - V9

SYNC FAILURE
No vert. sync - V10, V11
No horiz. sync - V10, V12, V13
No vert. or horiz. sync - V10

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18
No vertical deflection - V11
Poor vert. linearity or foldover - V11
Poor horiz. linearity or foldover - V13, V14, V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V10, V11
Horiz. off freq. - V10, V12, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multibrator tube (V13) to disable the high voltage.

VIDEO IF ALIGNMENT

Remove V1 (6BQ7A or 6BZ7) from its socket to minimize the possibility of undesirable beat response during alignment.
Connect a 470MMF capacitor across the vertical input terminals of scope.
Connect the negative lead of a 9 volt bias supply to the ungrounded side of C49. Connect the positive lead to chassis.
If a separate marker generator is used couple its output loosely to the sweep generator output cable.
If peaks appear at two different slug settings, use the one at farthest counter clockwise position.
Use high scope gain and only enough sweep generator output to provide usable pattern on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis near V5.	44MC (10MC Swp)	42.25MC 43.0MC 44.0MC 45.0MC 45.75MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A1, A2	Attach detuning clips (alligator clips) to pin 5 (plate) of V3 and V4 (6CB6's) Adjust A1 for maximum gain at 44MC. Adjust A2 for symmetrical response with markers shown as in Fig. 1. Remove detuning clips from pin 5 of V3 and V4.
2.	"	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis near V3.	Not used	47.25MC (400∿ Mod)	"	"	A3	Adjust for MINIMUM 400∿ response on scope.
3.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis near V4.	44MC (10MC Swp)	42.25MC 43.0MC 44.0MC 45.0MC 45.75MC	"	"	A4, A5	Attach detuning clip to pin 5 of V3. Adjust A4 for maximum gain at 44MC. Adjust A5 for symmetrical response with markers as shown in Fig. 2. Remove detuning clip from pin 5 of V3.
4.	"	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis near V3.	"	41.25MC 42.25MC 43.0MC 44.0MC 45.0MC 45.75MC 47.25MC	"	"	A6, A7 A10	Detune A10 (on tuner) several turns counter clockwise. Adjust A6 for maximum response at 44MC. Adjust A7 for symmetrical response with markers as shown in Fig. 3. Adjust A10 so that dip it produces on response curve is centered at 44MC. Replace RF amplifier tube (V1) in its socket.
5.	Fig. 6	Thru matching network (Fig. 6) across antenna terminals.	213MC (10MC Swp)	41.25MC 42.25MC 43.0MC 44.0MC 45.0MC 45.75MC 47.25MC	"	"	A8, A9	Set fine tuning control to its mid-range position. Clip high side of marker generator to converter tube shield (leave low side of marker generator disconnected). Adjust A9 for symmetrical response similar to Fig. 4. Adjust A8 for MINIMUM marker amplitude at 41.25MC.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to point (A). Low side to chassis.	Not used	4.5MC (Unmod)	Any Unused channel	Use VTVM. DC probe thru detector (Fig. 7) to pin 11 of picture tube. Low side to chassis.	A11	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 15KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to point (A). Low side to chassis.	4.5MC (15KC Swp)	4.5MC	Any Unused Channel	Vert. Amp. across volume control	A12	Attenuate generator output to give MINIMUM useful indication on scope. Adjust A12 for maximum response at 4.5MC.
8.	"	"	"	"	"	"	A13	Set generator to give a strong signal and adjust A13 for maximum response at 4.5MC.
9.	"	"	Not used	4.5MC (400∿Mod)	"	"	R5	Starting with a very low signal input, gradually increase the level, at the same time turning the quieting control (R5) back and forth until the signal level reaches the point where the AM output on the scope dips to zero with a rise on each side as R5 is rotated. Set R5 for zero output at this signal level.

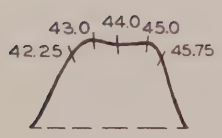

FIG. 1

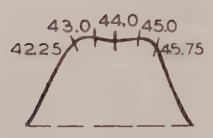

FIG. 2

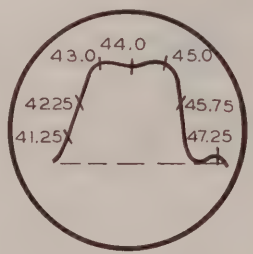

FIG. 3

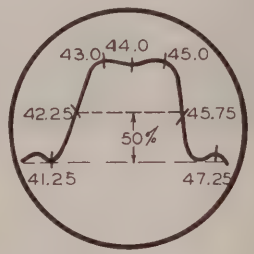

FIG. 4

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ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT USING A TV SIGNAL

Tune the receiver to a TV station and connect an attenuator between receiver and antenna so that the signal input to the receiver may be varied from weak to strong.
Set the quieting control (R5) to its mid-range position. Adjust A12 for maximum program sound.
If two peaks occur use the one with A12 farthest counter clockwise. Reduce signal to its lowest usable level and retouch A12 for maximum program sound.
Apply a strong signal to the receiver and adjust A13 for maximum program sound.
If two widely separated peaks occur use the one with A13 set farthest counter clockwise.
If two narrowly separated peaks occur insufficient signal is being applied or the quieting control is improperly adjusted.
Reduce the signal input to a very low level so that noise is heard from the speaker.
Adjust R5 for mimimum noise. Do not leave R5 at its maximum counter clockwise position.

RF AND MIXER ALIGNMENT FOR TUNER V-12415-1 USED IN CHASSIS 2260-14

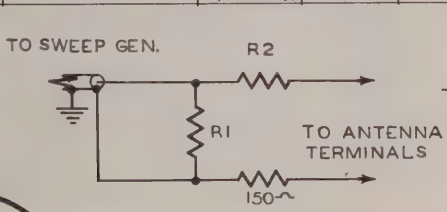
Disconnect the AGC lead to the tuner (white wire) and connect the negative lead of a 1.5 volt battery to the free end of the tuner AGC lead. Connect the positive lead to the chassis.
The series resonant trap (A29) should be adjusted in the field whenever local interference on channel 2 is encountered.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Fig. 6	Thru matching network (Fig.6) across antenna terminals.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (B). Low side to tuner chassis.	A14, A15 A16	Adjust for response curve similar to Fig.8 with markers above 90%.
11.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustments of A14, A15, and A16 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT (TUNER V-12415-1)

The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel. Leave the bias connected as under "RF and Mixer Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscillocope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Fig. 6	Thru matching network (Fig.6) across antenna terminals.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A17	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%. Restore tuner AGC lead (white lead) to its original connection.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A18	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A19	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A20	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A21	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A22	
			177MC (10MC Swp)	177.25MC 181.75MC	7		A23	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A24	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A25	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A26	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A27	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A28	



Zo = SWEEP CABLE IMPEDANCE.

Zo	R1	R2
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω

FIG. 6

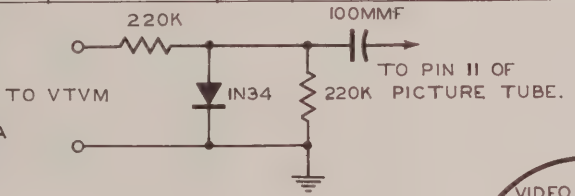


FIG.7

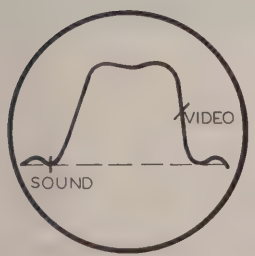


FIG.5

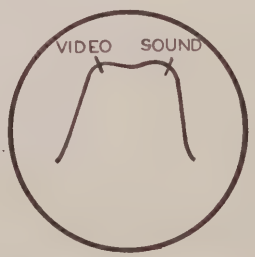


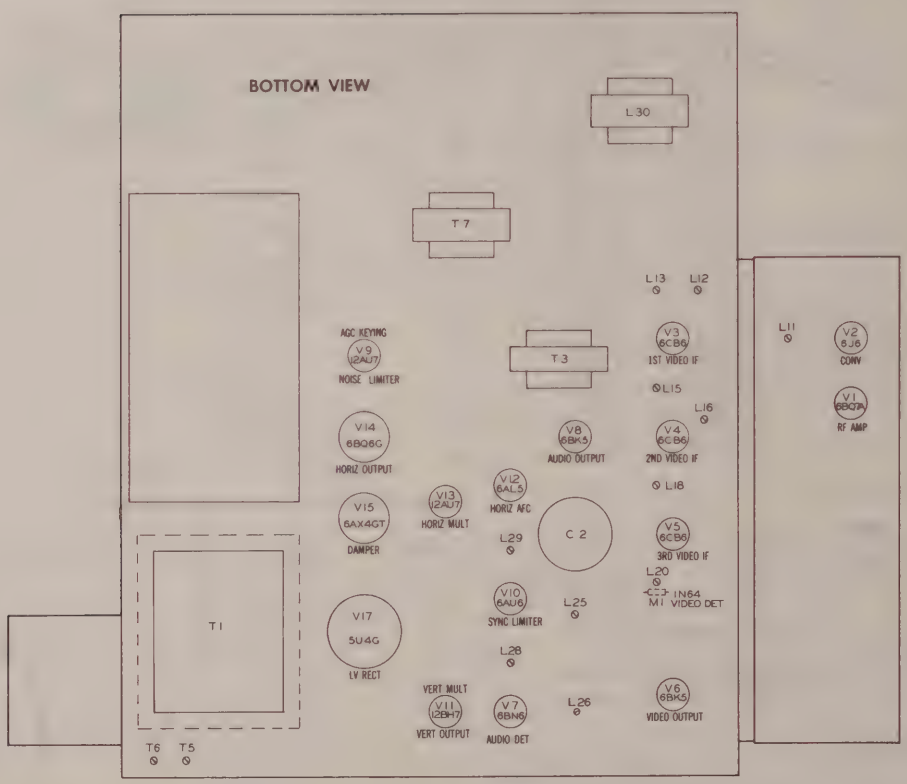
FIG.8

WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)

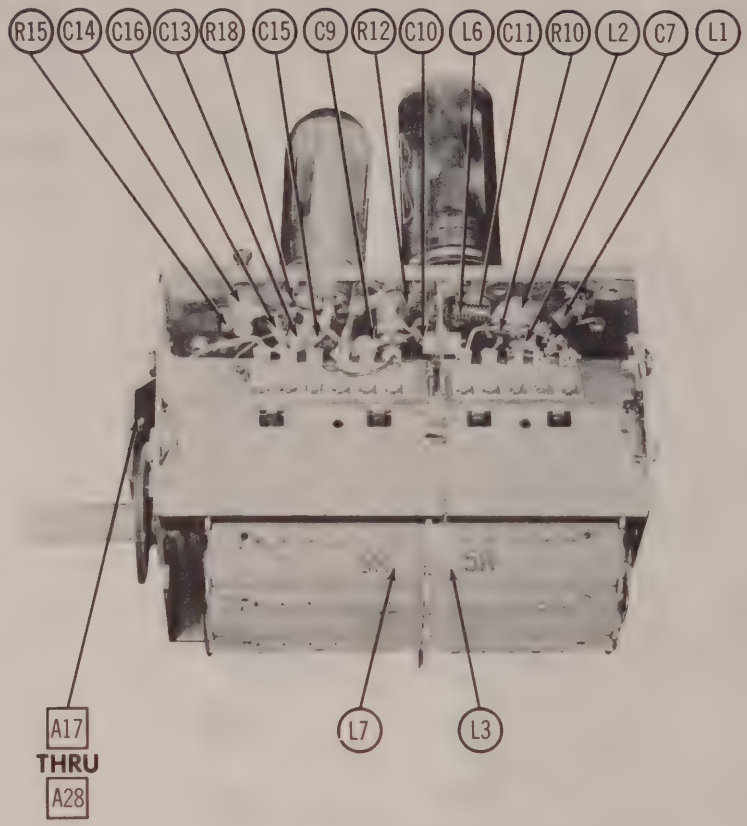
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF.	2. 2Meg	0Ω	. 1Ω	0Ω	† 4. 5KΩ	130KΩ	INF.	0Ω
V 2	6J6	† 8KΩ	† 18. 3KΩ	. 1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	110KΩ	68Ω	. 1Ω	0Ω	† 3. 5KΩ	† 3. 5KΩ	0Ω		
V 4	6CB6	110KΩ	68Ω	. 1Ω	0Ω	† 3. 5KΩ	† 3. 5KΩ	0Ω		
V 5	6CB6	. 4Ω	150Ω	. 1Ω	0Ω	† 4KΩ	† 4KΩ	0Ω		
V 6	6BK5	† 3. 5KΩ	INF.	2. 2KΩ	. 1Ω	0Ω	0Ω	2. 2KΩ	† 3. 1KΩ	INF
V 7	6BN6	180Ω	6. 5Ω	. 1Ω	0Ω	†22. 5KΩ	6Ω	† 330KΩ		
V 8	6BK5	† 1KΩ	80KΩ	80KΩ	0Ω	. 1Ω	180Ω	80KΩ	† 560Ω	† 500Ω
V 9	12AU7	2. 2Meg	80KΩ	45KΩ	0Ω	0Ω	1 Meg	1 Meg	1. 2KΩ	. 1Ω
V 10	6AU6	1 Meg	0Ω	0Ω	. 1Ω	† 40KΩ	† 160KΩ	1. 2KΩ		
V 11	12BH7	▲ 8KΩ	1. 5Meg	2. 5KΩ	0Ω	0Ω	▲ 5 Meg	515KΩ	2KΩ	. 1Ω
V 12	6AL5	1 Meg	0Ω	0Ω	. 1Ω	1 Meg	0Ω	2 Meg		
V 13	12AU7	† 47KΩ	2. 7Meg	820Ω	. 1Ω	. 1Ω	† 76KΩ	380KΩ	820Ω	0Ω
V 14	6BQ6G	INF.	0Ω	INF.	† 11. 1KΩ	470KΩ	INF.	. 1Ω	33Ω	TOP CAP ▲ 21Ω
V 15	6AX4GT	INF.	INF.	300KΩ		† 115Ω		. 1Ω	0Ω	
V 16	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								TOP CAP ▲ 97Ω
V 17	5U4G	INF.	20KΩ	INF.	24Ω	INF.	21Ω	INF.	20KΩ	
V 18	17LP4	0Ω	† 1. 7Meg	PIN 6 ▲ 500KΩ	PIN 10 ▲ 35KΩ	PIN 11 120KΩ	PIN 12 . 1Ω			

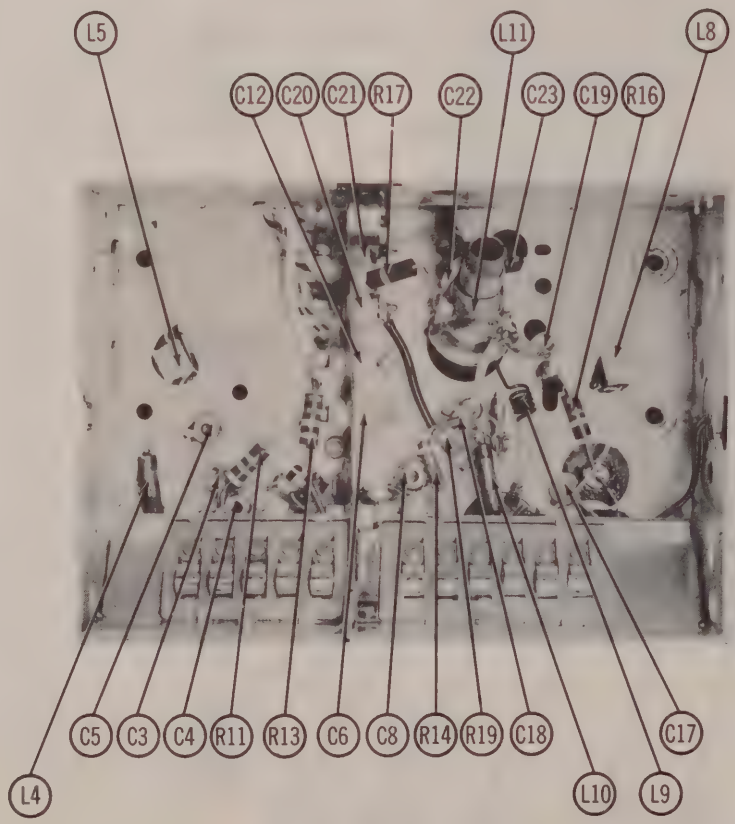
† MEASURED FROM PIN 8 OF V17.
▲ MEASURED FROM PIN 3 OF V15.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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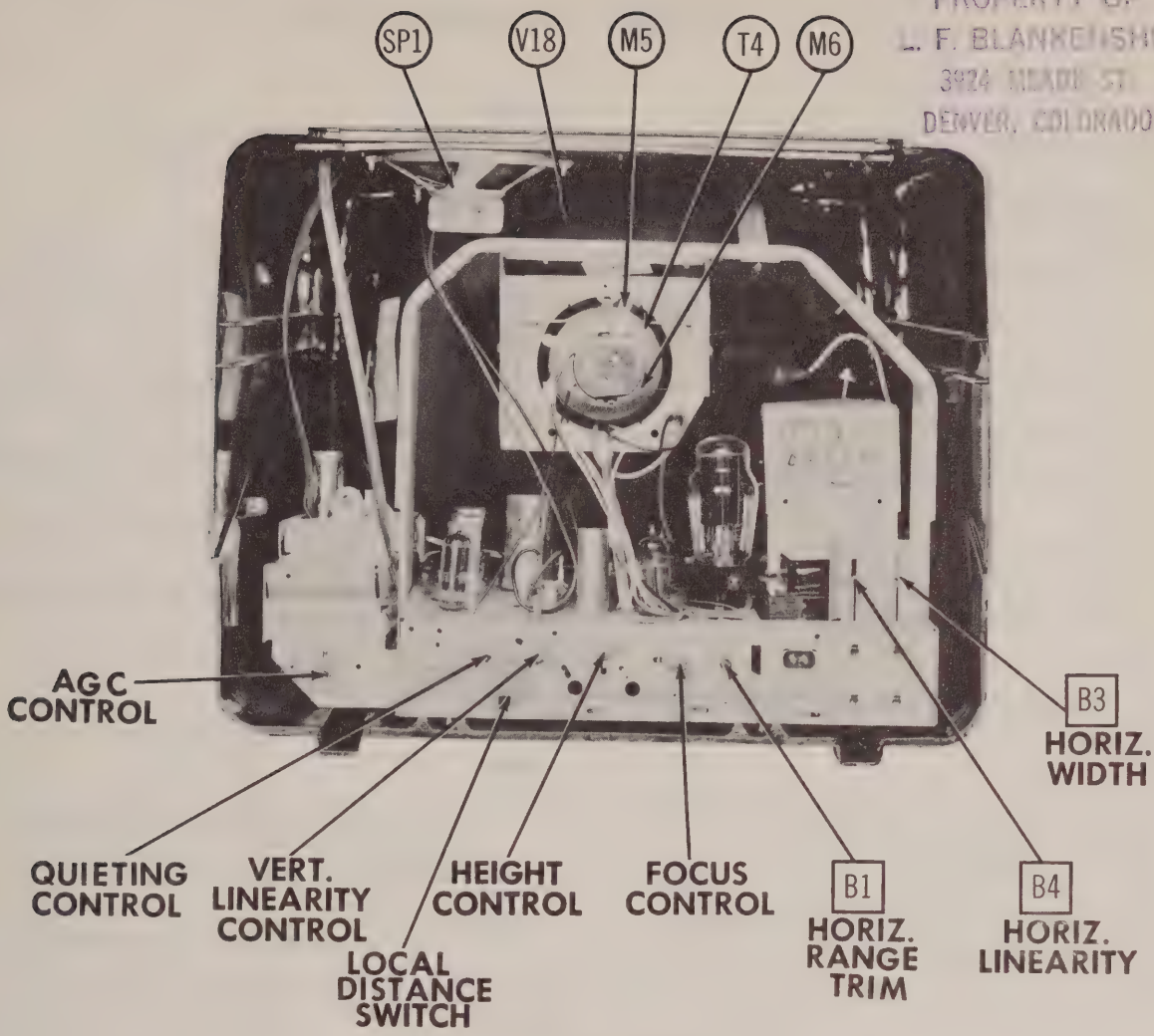

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control to its mid-range position.

Connect a short jumper across the horizontal oscillator coil (L29).

Connect the DC probe of a VTVM to pin 2 (grid) of 12AU7 (V13). Connect positive lead to chassis. Adjust horizontal range trimmer (B1) for zero volts at VTVM. If necessary, readjust horizontal hold control slightly to obtain zero reading at VTVM.

Remove jumper across L29 and adjust horizontal oscillator slug (B2) for zero reading at VTVM.

Switch off channel and back again. Picture should pull into sync.

Adjust the horizontal width slug (B3) for a picture that is slightly wider than necessary to fill picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check adjustments B3 and B4. Check by substitution V14, V15 and V17. Check T2, T4A, R103, R104, C85, C86 and other associated components.

DRIVE LINES

Check by substitution V14 and V15. Check adjustment B4. Check C81, C83, C84, R99, R102 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V14 and V15. Check adjustments B3 and B4. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V13, V14, V15. Check C77 for open. Check T2, T4A, C82, R92 and other associated components.

XMAS TREE EFFECT

Check by substitution V13, V14 and V15. Check T2 and T4A for internal arcing. Check L29, C79, C89, C84 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V11. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check T3, T4B, C2C and other associated components.	Check C64, R7, R75, C62 and other associated components.

INSUFFICIENT SWEEP

Substitute V11. Check height and vertical linearity controls for proper operation. If still unsatisfactory proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V11. Check R7, R75, R73, C68 and other associated components.

COMPRESSED AT TOP

Substitute V11. Check C2C, R6, R79 and other associated components.

FOLDS

Substitute V11. Check C69, R82, R83 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V9 and V10. Check C57, C58, C59, C60, R64, R65 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Substitute V11. Check vertical integrator network, C62, C63, R70, R3 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V12 and V13. Check C71, C74, C76, L29, R92 and other associated components.

HORIZONTAL BENDING

Check by substitution V9, V10, V12 and V13. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check L23, C43, L25, contrast control, picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check adjustment A11. Check video IFalignment.

POOR CONTRAST

Substitute V6. Check video crystal detector network. Check L23, R38, R42, C42, C43, C44, contrast control, picture tube and other associated components.

NEGATIVE PICTURE

Substitute V6. Check picture tube. Check video crystal detector network. Check components associated with V6.

SMEAR

Substitute V6. Check L23, L24, L21, L22, C43, R42, and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7 and V8. Check stage V8 using audio signal generator. Apply audio signal across R18.

If Satisfactory	If Unsatisfactory
Check audio detector stage for component failure or change of value.	Check C55, C56, C1D, C2A, T7, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment R5 and A13. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, substitute V17. Check B+ filter and decoupling network for component failure or change of value.

SMALL AND/OR DIM PICTURE

Substitute V17. Check B+ filter and decoupling network.

PROPERTY OF
L. F. BLANKENSHIP
3974 MEADE ST.
DENVER, COLORADO

ALTERNATE VHF TUNER SCHEMATIC

WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, CO. 80211

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: Westinghouse PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	6BZ7 also used in this model.
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6BK5	6BK5	9BQ	
V7	Audio Detector	6BN6	6BN6	7DF	
V8	Audio Output	6BK5	6BK5	9BQ	
V9	AGC Keying-Noise Limiter	12AU7	12AU7	9A	
V10	Sync Separator	6AU8	6AU8	7BK	
V11	Vert. Mult-Vert. Output	12BH7	12BH7	9A	
V12	Horiz. AFC	6AL5	6AL5	6BT	
V13	Horiz. Mult	12AU7	12AU7	9A	
V14	Horiz. Output	6BQ6G	6BQ6GT	6AM	6BQ6GT also used in this model.
V15	Damper	6AX4GT	6AX4GT	6CG	
V16	HV Rectifier	1B3GT	1B3GT	3C	
V17	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: Westinghouse PART No.	CBS-HYTRON PART No	GENERAL ELECTRIC PART No	SYLVANIA PART No	WESTINGHOUSE PART No	RETMA BASE TYPE	NOTES
V18	17LP4 / 17VP4	17LP4	17LP4 / 17VP4	17LP4 / 17VP4	17LP4	12L / 12L	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	V-9891-1	AFH4-85		D092		FP428.4	TVL-4720	
B	▲40	450								
C	▲30	350								
D	30	350								
C2A	▲40	450	V-10306-1	AFH4-82		D113	FP260 TC495		TVL-3753	
B	▲30	450								
C	▲150	50								
C3	3			SI3NP0	TCZ-3	Z007	NP0K-030 3139-01-1R5	ZT-5533	5TCCB-V33	
C4	3-9				829-10		3139-01-1R5			
C5	3-9				829-10		3139-01-1R5			
C6	3									
C7	3			SI3NP0	TCZ-3	Z007	NP0K-030	ZT-5533	5TCCB-V33	
C8	.5-3				829-3		3115-01-0R5	CT565A		
C9	120		BPD-0001Z	D6-121	GD64		801-121	UC-5313	5GA-T12	
C10	800									
C11	1000		BPD-001	DD-102	K069		801-001	DC-521	5HK-D1	
C12	800									
C13	47		BPD-000047	D6-470	GG53		801-470	UC-5447	5GA-Q47	
C14	.5-3				829-3		3115-01-0R5	CT565A		
C15	10		SI10NP0	TCZ-10	Z018		NP0K-100	ZT-541	5TCC-Q1	
C16	5									
C17	1000		BPD-001	DD-102	K069		801-001	DC-521	5HK-D1	
C18	1000		BPD-001	DD-102	K069		801-001	DC-521	5HK-D1	
C19	6.8		SI6.8NP0	TCZ-6.8	Z012		NP0K-6R8	ZT-5568	5TCCB-V68	
C20	800									
C21	800									
C22	1000		BPD-001	DD-102	K069		801-001	DC-521	5HK-D1	
C23	150		SI150N750	TCN-150	TN26		N750L-151		5TCU-T15	
C24	5000		V-5596-1	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	Note 1
C25	.05	600	RCP10M6503M	P688-05	DF-503	CUB6S5		PT615	5TM-S5	Note 3
C26	.02	600	RCP10M6203M	P688-02	DF-203	CUB6S2	817-02	PT612	5TM-S2	
C27	2.2		V-5658-14	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C28	68		RICC20E2L680K	SI68	D6-680	TP33	GPIK-680	UC-5468	5GA-Q68	
C29	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C30	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C31	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C32	2.2		V-5658-2	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C33	47		RICC20E3L470K	SI47	D6-470	TP29	GPIK-470	UC-5447	5GA-Q47	
C34	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C35	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C36	5000		V-5596-1	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C37	.47		V-5658-11		TCZ-.47	TZ01	NP0K-R47			
C38	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C39	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C40	800		V-9863-1	BPD-0008	DD-801	K069	801-001	DC-521	5HK-D1	
C41	150	500	RCM20B151K	1468-00015	D6-151	5WS715	GP2K-151	MC236	1FM-315	
C42	33		V-5658-13	SI33	D6-330	TP27	GPIK-330	UC-5433	5GA-Q33	
C43	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C44	50	500	RCM20B550K			22R5Q56				
C45	25	400	RCP10W4254M	P488-25		CUB4P25		PT4025	4TM-P25	
C46	220	500	RCM20B221K	1468-00025	D6-221	5WS722	GP2K-221	MC240	1FM-325	
C47	100	500	RCM20B101K	1469-0001		22R5T1		MC235	MS-31	
C48	.05	400	RCP10W4503M	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C49	.25	400	RCP10W4254M	P488-25		CUB4P25		PT4025	4TM-P25	
C50	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C51	3.3		V-9826-2	SI3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5633	5TCCB-V33	
C52	3.3		V-9826-2	SI3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-V33	
C53A	5000		V-9044-1	BPD-2X0047	DD3-502	DK079	811-005	DCD-525	5HK-2D47	
B	5000						811-005			
C54	2000		R2CC63Y5Y202M	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C55	.02	600	RCP10M6203M	P688-02	DF-203	CUB6S2	817-02	PT612	5TM-S2	
C56	.005	600	RCP10M6503M	P688-005	D6-502	CUB6D5	GP2-333-502	PT615	6TM-D5	
C57	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C58	270	500	RCM20B271K	1469-0003		5RS7T39		MC241	MS-33	
C59	.01	600	RCP10M6103M	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C60	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C61A	5000		V-9044-1	BPD-2X0047	DD3-502	DK079	811-005	DCD-525	5HK-2D47	
B	5000						811-005			
C62	.005	400	RCP10M6502M	P688-005	D6-502	CUB6D5	GP2-333-502	PT635	6TM-D5	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C63	.05	400	RCP10W4503M	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C64	.1	600	RCP10M6104M	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C65	.001	1000	RCP10M1002M	P1D88-001	DD30-102	CUB1HD1	HR5KV-102	PT1611	MH-D1	
C66	.001	600	RCP10M6102M	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C67	.002	600	RCP10M6202M	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C68	.02	600	RCP10M6203M	P688-02	DF-203	CUB6S2	817-02	PT612	6TM-S2	
C69	.02	600	RCP10M6203M	P688-02	DF-203	CUB6S2	817-02	PT612	6TM-S2	
C70	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C71	150	500	RCM20B151K	1469-00015		22R5T15		MCB235		
C72	200	500	RCM20B201K	1469-0001		22R5T1		MCB235	MS-31	
C73	390	500	RCM20B391K	1469-0004		5R5T39		MCB243	MS-34	
C74	680	500	RCM20B681K	1479-0007		5R5T68			MS-37	
C75	.01	600	RCP10M6103M	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C76	.005	400	RCP10M6502M	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C77	.01	600	RCP10M6103M	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C78	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C79	3900	500	RCM3C392K	1464-004		1R5D39		MCE463	MS-34	
C80	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C81	.25	400	RCP10W4254M	P488-25		CUB4P25		PT4025	4TM-P25	
C82	100	500	RCM20B101K	1469-0001		22R5T1		MCB235	MS-31	
C83	390	500	RCM20B391K	1469-0004		5R5T39		MCB243	MS-34	
C84	.01	600	RCP10M6103M	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C85	.1	600	RCP10M6104M	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C86	.1	400	RCP10W4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C87	.04	400	RCP10M4403M	P588-04		CUB6S4		PT634	6TM-S4	
C88	5000		V-5596-1	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	
C89	.25	400	RCP10M4254M	P488-25		CUB4P25		PT4025	4TM-P25	
C90	.06	600	RCP10M4603M	P688-06		CUB6S6		PT636	6TM-S6	
C91	51		V-9792-10510J							
C92	.01	600	V-5040-15	5892ZK-01		CUB6S1		PT611	6TM-S1	
C93	100	500	RCM20B101K	1469-0001		22R5T1		MCB235	MS-31	Note 2
C94	47	500	RCM20B470K	1469-00005		22R5Q47		MCB225	MS-45	Note 2
C95	5000		V-5596-1	BPD-005	DD-502	K060	811-005	DC-525	5HK-D5	

Note 1. Used with VHF tuner part #V12400-1 only.
Note 2. Not used in all Models.
Note 3. Some versions may use a .1MFD in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	15KΩ	½	V-11695-2			F1-26	UK-7908	Contrast tapped @ 4KΩ &7KΩ
								Panel
B	500KΩ	½				R2-47		Volume tapped @ 50KΩ-Rear
C	Switch					KB-1		Attach to R1A
R2A	60KΩ	½	V-11538-3	Q11-125	A47-50K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R2A
R3A	500Ω	½	V-11538D-3	Q11-114	A47-500-S	AB-10	U-14	Vert. Hold
B	Shaft		Not Req.	Not Req.	RS-3	AK-4	Not Req.	Attach to R3A
R4A	100KΩ	½	V-11536D-2	Q11-128	A47-100K-S	AB-40	U-41	Brightness
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req.	Attach to R4A
R5	500Ω	1	V-11345-2		39-500			Quieting-wire wound
R6A	5000Ω	½	V-5463	Q11-114	A47-5000-S	AB-10	BU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	5 Meg	½	V-9813C-5	Q11-141	A47-5Meg-S	AB-87	SU-67	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	2 Meg	½	V-9894-2	Q11-139	A47-2Meg-S	BX-75	SU-56	Focus
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Not Req.	Attach to R8A
R9	1 Meg	½	V-12373-1					AGC

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R10	15KΩ	½		BTS-15K	
R11	47KΩ	½		BTS-47K	
R13	330KΩ	½		BTS-330K	
R13	220KΩ	½		BTS-220K	
R14	470Ω	½		BTS-470	
R15	15KΩ	½		BTS-15K	
R16	220KΩ	½		BTS-220K	
R17	15KΩ	½		BTS-15K	
R18	10KΩ	½		BTS-10K	
R19	4700Ω	½		BTS-4700	
R20	150Ω	1	RC20AE151M	BTS-150	
R21	3900Ω	2	RC40AE392M	BTS-3900	
R22	18Meg 5%	½	RC20AE186J	BTS-18Meg 5%	
R23	1.5Meg 5%	½	RC20AE155J	BTS-1.5Meg 5%	
R24	10KΩ	½	V-9927-10	BTS-10K	
R25	10Ω	½	RC20AE100M	BTS-10	
R26	390KΩ	½	RC20AE394K	BTS-390K	
R27	470Ω	½	RC20AE471M	BTS-470	
R28	4700Ω 5%	½	V-9927-2	BTS-4700 5%	
R29	10KΩ	½	RC20AE103M	BTS-10K	
R30	100KΩ	½	RC20AE104J	BTS-100K	
R31	68Ω	½	RC20AE680K	BTS-68	
R32	470Ω	½	RC20AE471M	BTS-470	
R33	4700Ω 5%	½	V-9927-2	BTS-4700 5%	
R34	150Ω	½	RC20AE151M	BTS-150	
R35	470Ω	½	RC20AE471M	BTS-470	
R36	1000Ω	½	RC20AE102K	BTS-1000	
R37	2200Ω	½	RC20AE222K	BTS-2200	
R38	8200Ω	½	RC20AE822K	BTS-8200	
R39	2200Ω	2	RC30AE223K		
R40	2700Ω	2			
R41	22KΩ	1	RC30AE223K		
R42	150KΩ	½	RC20AE154K	BTS-150K	
R43	270KΩ	½	RC20AE274K	BTS-270K	
R44	1.5Meg 5%	½	RC20AE155K	BTS-1.5Meg 5%	
R45	120KΩ	½	RC20AE124K	BTS-120K	
R46	22KΩ	2	RC40AE223K	BTS-22K	
R47	470KΩ	½	RC20AE471M	BTS-470	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R48	330KΩ	½	RC20AE334K	BTS-330K	
R49	12KΩ	½	RC20AE123A	BTS-12K	
R50	150Ω	½	RC20AE151M	BTS-150	
R51	180Ω	½	RC20AE181K	BTS-180	
R52	470Ω	2	RC40AE471K	BTS-470	
R53	180KΩ	½	RC20AE184K	BTS-180K	
R54	82KΩ	½	RC20AE823J	BTS-82K	
R55	4700Ω	½	RC20AE472K	BTS-4700	
R56	82KΩ	½	RC20AE823K	BTS-82K	
R57	8200Ω	½	RC20AE823J	BTS-8200	
R58	47KΩ	½	RC20AE473J	BTS-47K	
R59	1 Meg	½	RC20AE105K	BTS-1 Meg	
R60	470KΩ	½	RC20AE474K	BTS-470K	
R61	1 Meg	½	RC20AE105K	BTS-1 Meg	
R62	120KΩ	½	RC20AE123K	BTS-120K	
R63	220KΩ	½	RC20AE224K	BTS-220K	
R64	270KΩ	½	RC20AE274K	BTS-270K	
R65	100KΩ	½	RC20AE104K	BTS-100K	
R66	18KΩ	½	RC20AE183K	BTS-18K	
R67	22KΩ	½	RC20AE223K	BTS-22K	
R68	8200Ω	½	RC20AE822K	BTS-8200	
R69	8200Ω	½	RC20AE822K	BTS-8200	
R70	82KΩ	½	RC30AE823K	BTS-82K	
R71	470KΩ	½	RC20AE474K	BTS-470K	
R72	47KΩ	½	RC20AE473K	BTS-47K	
R73	10 Meg	½	RC20AE106K	BTS-10 Meg	
R74	100KΩ	½	RC20AE104K	BTS-100K	
R75	3.3Meg	½	RC20AE335K	BTS-3.3Meg	
R76	2.2Meg	½	RC20AE225K	BTS-2.2Meg	
R77	100Ω	½	RC20AE101K	BTS-100	
R78	1.5Meg	½	RC20AE155K	BTS-1.5Meg	
R79	680Ω	½	RC20AE681K	BTS-680	
R80	12KΩ	½	RC40AE123K	BTS-12K	
R81	12KΩ	2	RC40AE123K	BTS-12K	
R82	18KΩ	½	RC20AE183J	BTS-18K	
R83	5600Ω	½	RC20AE562K	BTS-5600	
R84	560Ω	½	RC20AE561K	BTS-560	
R85	560Ω	½	RC20AE561K	BTS-560	

RESISTORS (cont)

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R86	390Ω	½	RC20AE391K	BTS-390	
R87	1 Meg	½	RC20AE105K	BTS-1 Meg	
R88	1 Meg	½	RC20AE105K	BTS-1 Meg	
R89	220KΩ	½	RC20AE224K	BTS-220K	
R90	470KΩ	½	RC20AE474K	BTS-470K	
R91	47KΩ	½	RC20AE473K	BTS-47K	
R92	820Ω	½	RC20AE821K	BTS-820	
R93	27KΩ	½	RC20AE273K	BTS-27K	
R94	22KΩ	½	RC30AE223K	BTS-22K	
R95	270KΩ	½	RC20AE274J	BTS-270K	
R96	10KΩ	½	RC20AE103K	BTS-10K	
R97	10KΩ	½	RC20AE103K	BTS-10K	
R98	56KΩ	½	RC20AE563K	BTS-56K	
R99	5600Ω	½	RC20AE562K	BTS-5600	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: Westinghouse PART No.	IRC PART No.	NOTES
R100	470KΩ	½	RC20AE474K	BTS-470K	
R101	150Ω	1	RC20AE151M	BTS-150	
R102	33Ω	1	RC30AE330K		
R103	22KΩ	2	RC40AE223K	BTS-22K	
R104	22KΩ	2	RC40AE223K	BTS-22K	
R105	1000Ω	½	RC20AE102K	BTS-1000	
R106	33KΩ	1	RC30AE333K	BTS-33K	
R107	100KΩ	1	RC30AE104K	BTA-100K	
R108	1000Ω	10	B10055D-3		
	2000Ω	10			
R109	50Ω	10	V-11328-8		
R110	220KΩ	1	RC30AE224M	BTA-220K	
R111	68Ω	½		BTS-68	
R112	18KΩ	½		BTS-18K	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: Westinghouse PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC	600VCT	5VAC	V-11544-4		P-3066 ①	R-81BC ②			
	① 1.84A	.270ADC	③ 3A							
	SEC. 3	SEC. 4	SEC. 5							
	12.6VCT									
	④ 5A									

① Use low voltage sec. taps. Tape high voltage sec. taps. Taps 5V ④ 2A, and 6.3V ④ 2.6A.
② Connect the 2 6.3V ⑤ 8A windings in series for Sec. # 3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: Westinghouse PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Horiz.Output Trans.	V-11548-3	A-8236 *	HVO-9 ③ MWC-1 ④	D-38*	2327I *	F3411 & RF6004 ④	
T3	Vert.Output Trans.	V-10909-2	A-8141	A-3039	A-104X	226T1	21806	26S54
T4A	Yoke- Horiz. (20MB)	V-12218-1 ④	DY-11A ③	MDF-73 ③	Y-22-1 ③	2322U ⑤	DF805 ⑤	Y-10 ⑤
B	Vert. (23MB)							
T5	Horiz.Lin.Coil (1.8-9MH)	V-11789-1 ④	WC-8 ⑤	MWC-8 ⑤	WC-12 ⑤ ⑥	215R1 ⑤	RF8005 ⑤	WC-18 ⑤, WC-17 ⑤ ⑥
T6	Width Coil (1-5.5MH)	V-11791-1 ④	WC-8 ⑤ ⑥	MWC-8 ⑤	WC-12 ⑤ ⑥	211R1 ⑤		

① Drill new mounting holes.
② Includes capacitor C91, resistors R84, R85 and R86.
③ Use original yoke cover and positioning device.
④ Includes mounting bracket.
⑤ Drill new mounting hole, or use original slider and core.
⑥ Connect to coded blue and green terminals.
⑦ Connect to terminals #3 and #4.
⑧ Do not use tap.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
3	3	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead	Hi-Volt Rect Plate Lead	
2	2	9	10	10	9	
4	4	7	9 & T	8	See Note ⑩	
8	8	3	5	4	3	
7	7	1	3	3	1	
5	5	MWC-1 (Blue Term)	2	1	RF800 (Term #1)	
6	6	MWC-1 (Red Term)	1	2	RF800 (Term #2)	
Connect Width Coil Across →	8 & 7	8 & 7	MWC-1 (Orange & Black Term) 3 & 5	4 & 3	RF800 (Term #3 & #4 2 & 1	
Special Notes →		③			⑦ ⑩	

⑨ If AGC does not function properly, reverse secondary connections to width coil.
⑩ Connect damper cathode (clear lead) to terminal #8, connect yoke (red lead) to terminal #5.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: Westinghouse PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No	NOTES
T7	7.3KΩ	3.2Ω	V-9238D-2	A-8114	A-2921	S-7X	Z1003 ②	26S48 ②	1 Alternate audio output. 2 Drill one new mounting hole.
			V-14080-2 ①						

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: Westinghouse PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3.2Ω	V-10030-1	SF-803 Mod. P525V	52A1	

WESTINGHOUSE MODELS H-798T17, H-798TU17, H-799T17, H-799TU17 (Ch. V-2260-12, -14, V-2270-122, -124)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Westinghouse PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω						Wound on 68MMF Cap.
L2	IF Trap	0Ω						Wound on 68MMF Cap.
L3	Ant. Coils	0ΩCT	0Ω					
L4	IF Trap	.9Ω						
L5	Fil. Choke	0Ω						
L6	Neutr. Coil	0Ω						
L7	RF, Mixer Grid & Osc. Coils	0Ω						
L8	Fil. Choke	0Ω						
L9	RF Choke	0Ω						
L10	Feedback Coil	1.3Ω						
L11	Conv. Plate	0Ω						
L12	1st. Video IF	0Ω		V-9882-8	17-4524 *		6219 *	
L13	41.25MC Trap	0Ω		V-11973-1				
L14	Fil. Choke	0Ω		V-4886-2	19-1000	TV-189	4602	1.1 Microhenries
L15	2nd. Video IF	.5Ω	.4Ω	V-9879-1	17-4531 ■		6231	
L16	47.25MC Trap	0Ω		V-11973-1	20-1047			
L17	Fil. Choke	0Ω		V-4886-2	19-1000	TV-189	4602	1.1 Microhenries
L18	3rd. Video IF	.5Ω	.4Ω	V-9879-1	17-4531 ■		6231	
L19	Fil. Choke	0Ω		V-4886-2	19-1000	TV-189	4602	1.1 Microhenries
L20	4th. Video IF	.5Ω	.7Ω	V-12128-1				Includes crystal, caps., series peaking coil
L21	Series Peaking Coil	2.8Ω		V-9915-5	19-7047		4562	50 Microhenries
L22	Shunt Peaking Coil	11Ω		V-5902-5	19-3250	TV-185	6181	250 Microhenries
L23	Series Peaking Coil	4.6Ω		V-5902-1	19-3125	TV-184	4644	140 Microhenries
L24	Shunt Peaking Coil	18Ω		V-9915-3	19-3500	TV-188	6174	500 Microhenries
L25	4.5MC Trap	1.1Ω		V-9882-3	20-1004	TV-151	1470	
L26	Sound IF	6.5Ω		V-9883-3	20-1006	TV-151	1469	
L27	Fil. Choke	0Ω		V-4886-2	19-1000	TV-189	4602	1.1 Microhenries
L28	Quadrature Coil	6Ω		V-11396-1	17-1031 ▲		1470A	
L29	Horiz. Osc.	77Ω		V-6764	19-1576	TV-163	6210	

* Use one winding only.
■ Detune trap.
▲ Drill mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA Westinghouse PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L30	270ADC	41Ω	1.3HY	V-6471J3	C-2326 ①	C-2996 ①	C-17X ①	C5037 ①	26C44 ①

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA Westinghouse PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M1	1N64	V-10916-1	1N60, 1N132	1N60, 1N64A	Video det.

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M2	Dial Light		#47, Bayonet.
M3	Tuner	V-12400-1	VHF - Ch. V-2260-12, V-2270-122, 124
	Tuner	V-12415-1	VHF - Ch. V-2260-14
	Tuner	V-12390-1	UHF - Ch. V-2270-122
	Tuner	V-11972-1	UHF - Ch. V-2270-124
M4	Switch	V-5406	Local-Distance
M5	Centering Device		Part of yoke cover (T4)
M6	Ion Trap	V-9784-4	
B1	Trimmer Cap.	V-11228-2	Multivibrator trimmer (5-80MMF)
	Cabinet	V-1304-2	Models H-798T17, H-798TU17
	Cabinet	V-1304-1	Models H-799T17, H-799TU17
	Knob Assy.	V-12118-1	Channel Selector - Ch. V-2260-12
	Knob Assy.		Channel Selector - Ch. V-2260-14
	Knob		Fine tuning - Models H-798T17, H-798TU17, H-799T17, H-799TU17
	Knob	V-11980-6	On/off/volume - Models H-798T17, H-798TU17
	Knob	V-11980-1	On/off/volume - Models H-799T17, H-799TU17
	Knob	V-11979-2	Contrast - Models H-798T17, H-798TU17, H-799T17, H-799TU17
	Safety Glass	V-12003-1	Models H-798T17, H-798TU17, H-799T17, H-799TU17

TROUBLE SHOOTING AIDS (cont)

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HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V13, V14, V15 and V16. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C87, C90, C89, C85, R103, R104, and other associated components.	Check L29, C79, C82, C84, C81, R97, R96, R93 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V13, V14, V15, V16 and V17. Check T2, T4A, T5, T6, R103, R104, C84 and other associated components.

BLOOMING

Check by substitution V14, V15, V16 and V17. Check T2 and T4A. Check B+ filter and decoupling network.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5, V6 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

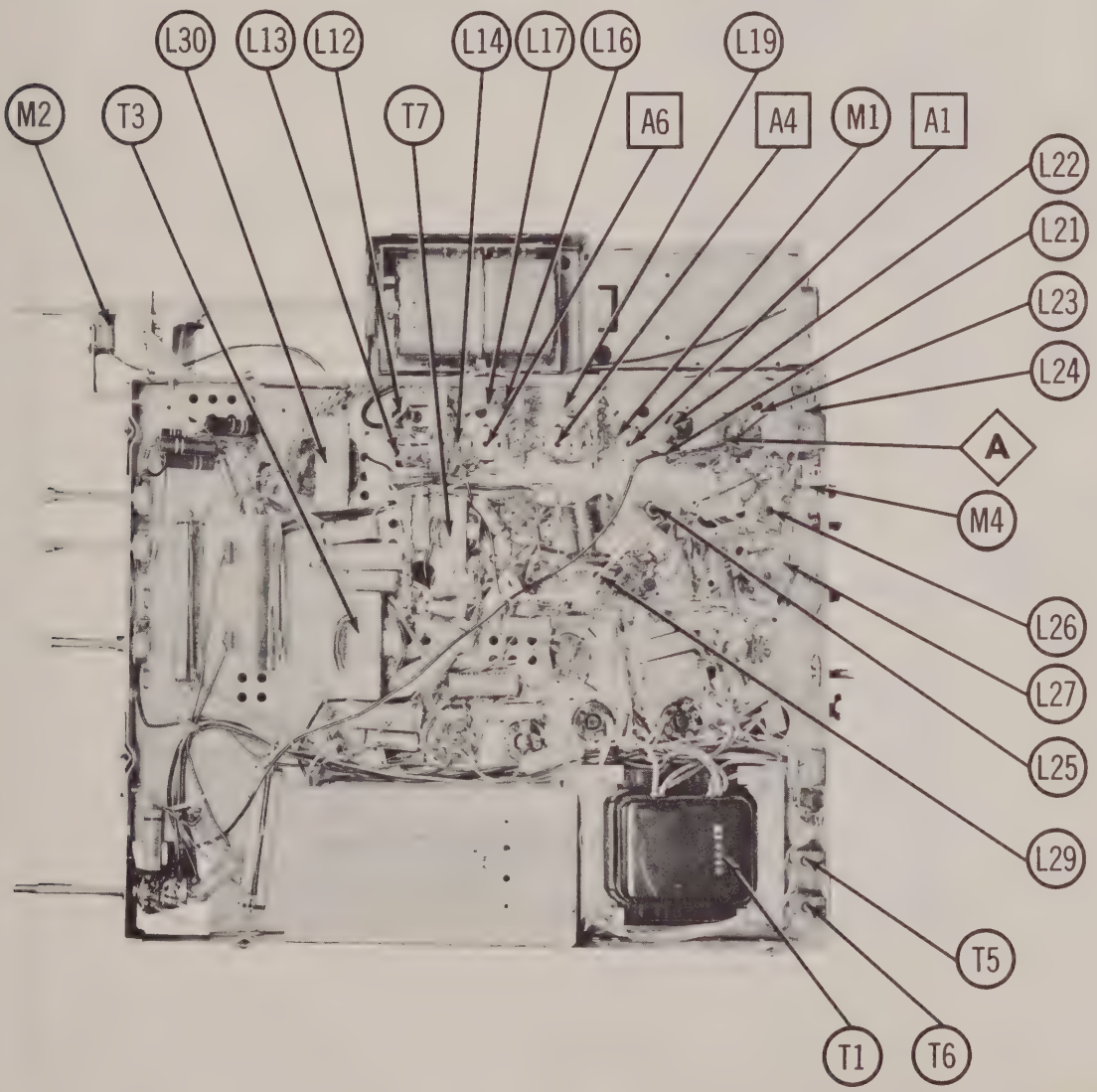
KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

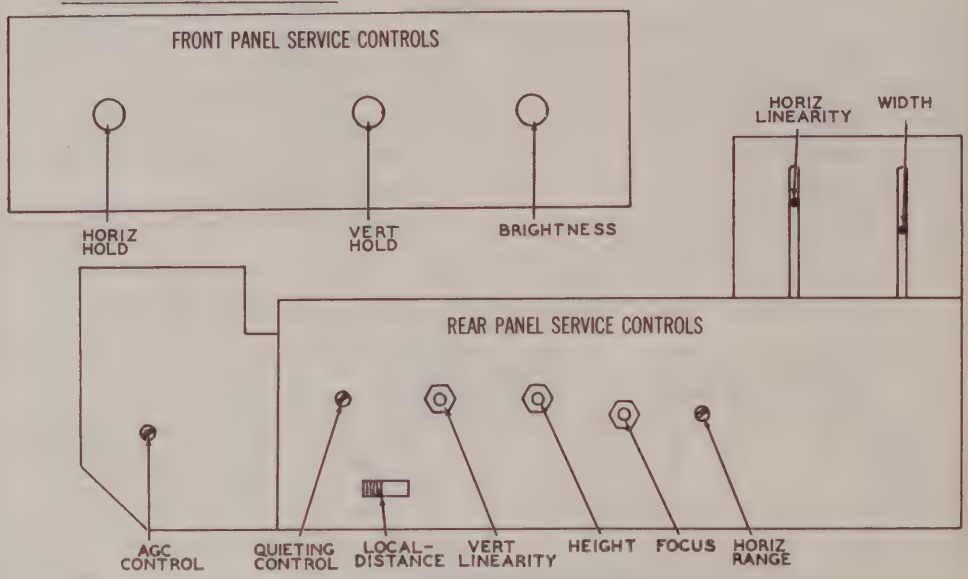
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - AGC CONTROL ADJUSTMENT

Set the "Local-Distant" switch to "Distant" position. Tune in the strongest TV station available and turn the AGC control clockwise until the picture just begins to overload then back off control until no evidence of overload remains. If evidence of overload remains with the AGC control in its fully counter clockwise position switch the "Local-Distant" switch to "Local position and adjust AGC control as above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal frequency (L29) until, picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the quieting control located on rear apron of the chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push-on type control knobs from front panel.
2. Disconnect built-in antenna from rear cover.
3. Remove 2 metal screws. Remove rear cover.
4. Disconnect speaker.
5. Remove 4 metal screws and speed nuts from speaker mounting board.
6. Remove mounting board.
7. Remove 4 chassis bolts. Remove chassis.

NOTE: The 2 metal screws in the rear sides of the speaker mounting board do not have to be removed to remove speaker. (Cabinet brace screws).

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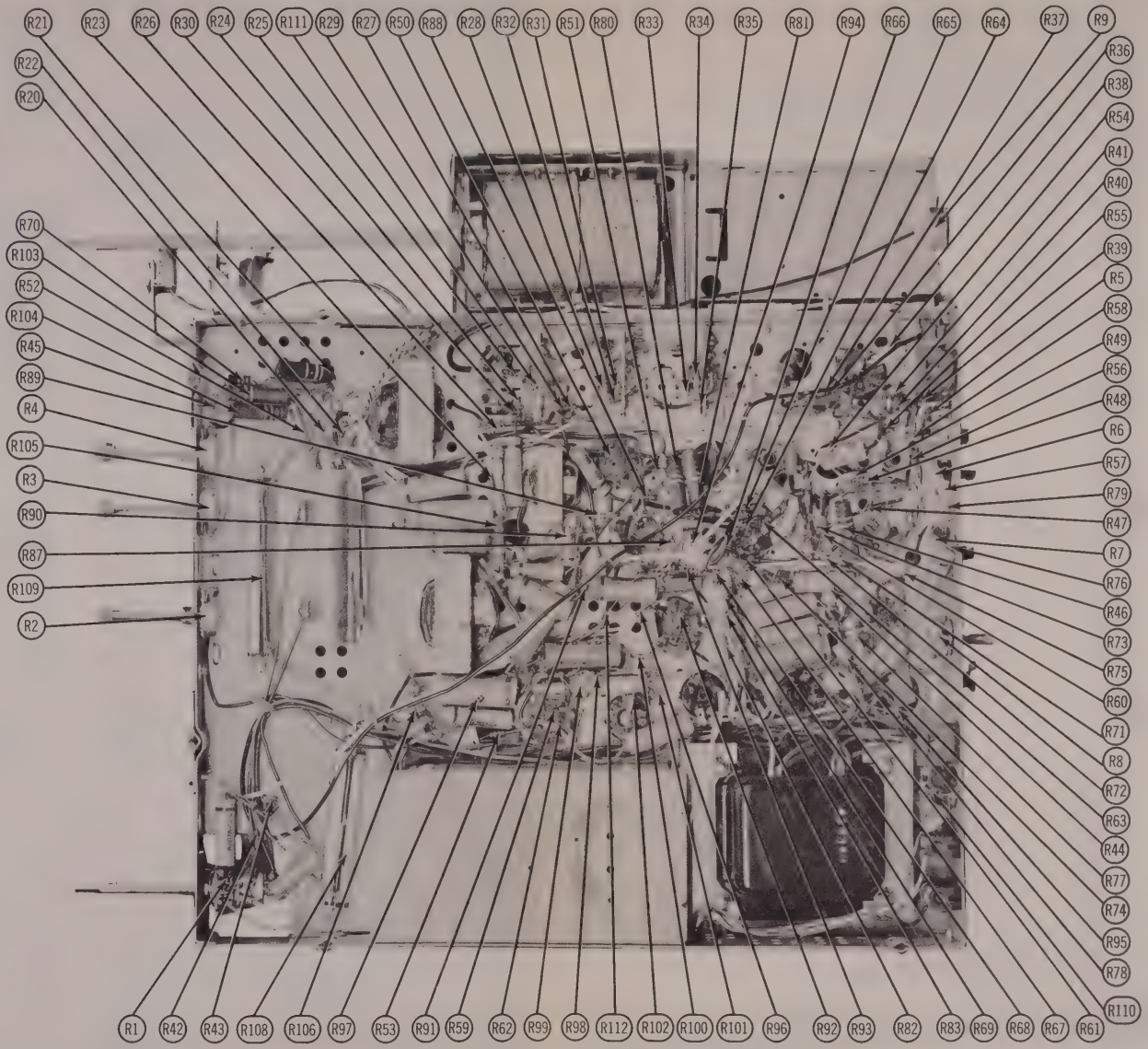

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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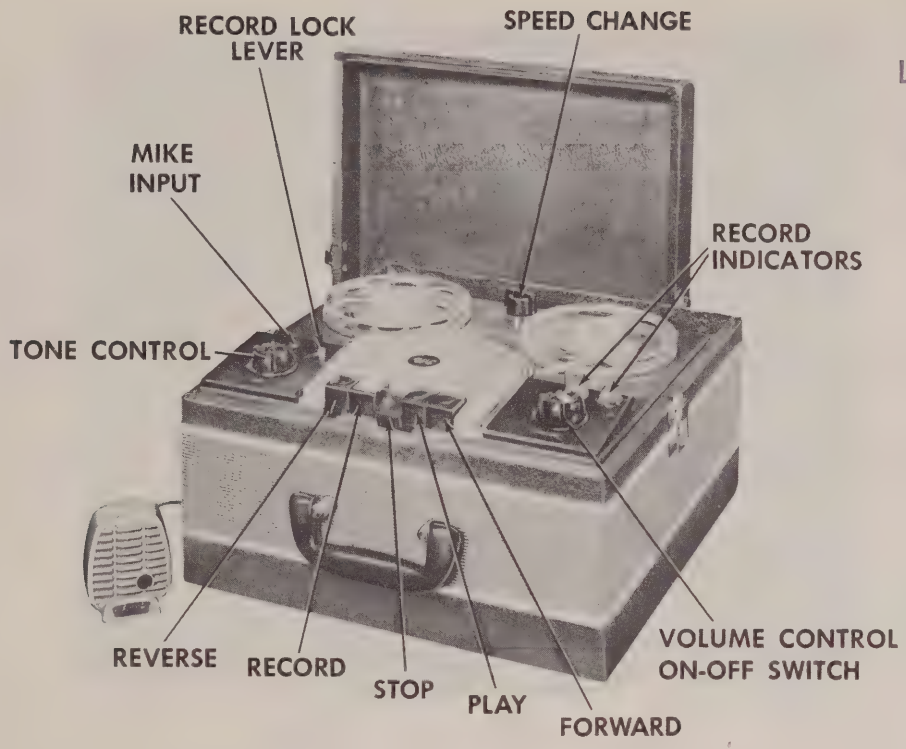

Figure 1

GENERAL INFORMATION

The Model 4A10 Wilcox-Gay "Recordio" features fingertip operation for Fast Forward, Playback, Stop, Record and Fast Reverse. The "Recordio" is designed to record and play back two tracks of material on standard width recording tape, which doubles the playing time of a standard 5" or 7" reel of tape with no loss of frequency response or quality. Recordings can be played back through the self-contained speaker or an external speaker through use of the Auxiliary Speaker Jack.

Model 4A10 has two tape speeds, 7 1/2" and 3 3/4" per second. Using both tracks, the recording time is as follows:

SIZE	SPEED 3-3/4"	SPEED 7-1/2"
5" reel	1 hour	1/2 hour
7" reel	2 hours	1 hour

The "Recordio" is designed to operate on 60 cycle, 115 volt, AC supply.

CAUTION: Severe Damage Will Result If Connection Is Made To A Direct Current (DC) Line.

Manufactured by:

Wilcox-Gay Corporation
Brooklyn, N. Y. Charlotte, Mich.

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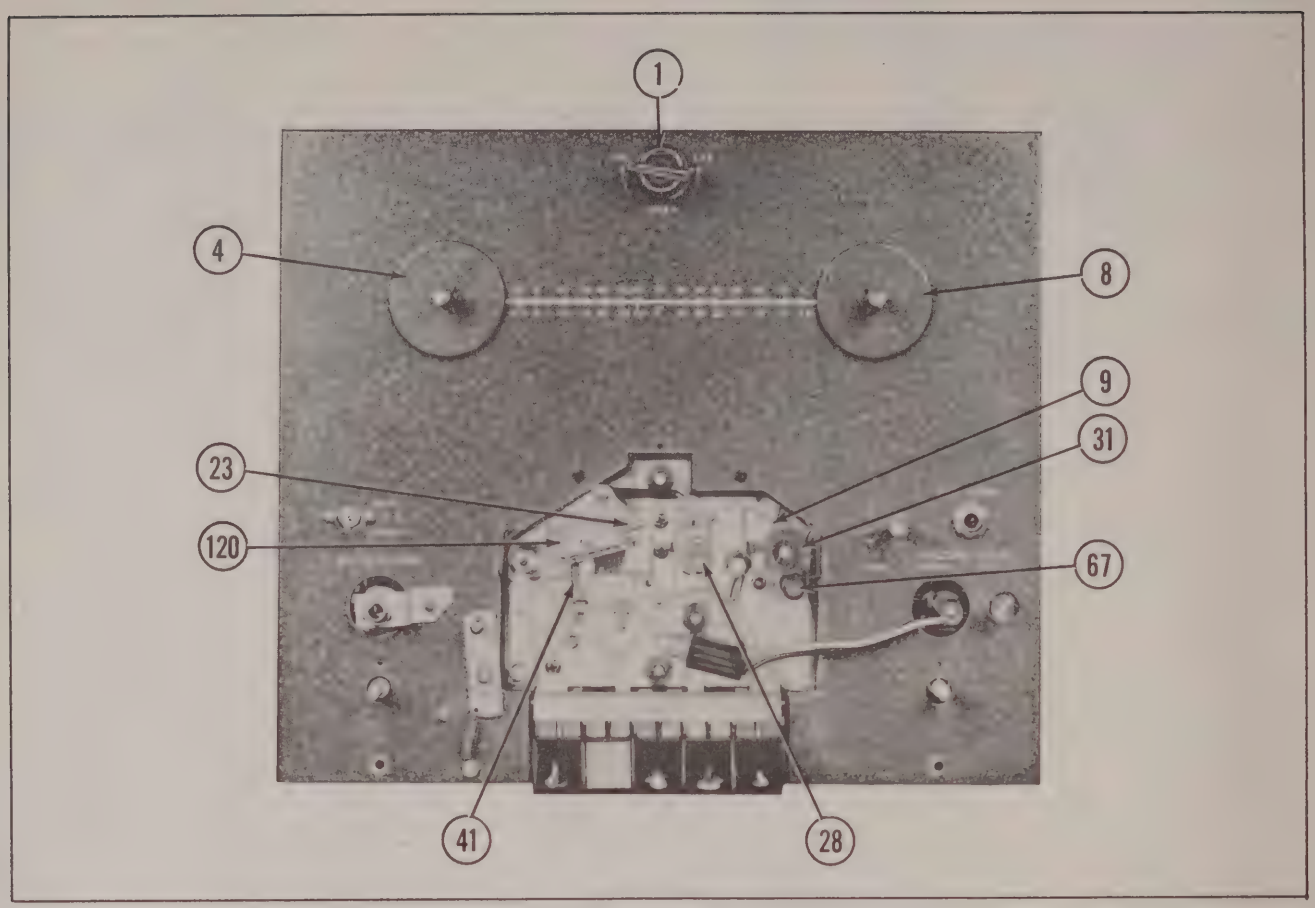

Figure 2

OPERATING INSTRUCTIONS

1. Plug the AC cord into a convenient wall receptacle of the proper rating.

Threading The Tape-

1. Place a reel of tape on the left spindle (4) and an empty reel on the right spindle (8) making sure the reel slots engage the reel pin on the spindles.

2. Unwind about 14" of the tape from the reel. Hold a section of the tape straight with both hands and insert the tape in the tape slot making sure the dull coated side of the tape faces the rear of the recorder.

NOTE: This recorder uses Type "A" wound tape, i. e. the dull magnetic coated side faces inward on the reel. If the tape to be used is Type "B" (coated side facing outward) place the reel on the left spindle so that the tape will lead-off in a clockwise direction. Bring the tape behind the rear cover (5) (not through the head slot) and thread it on to the right reel in the normal manner. Press the "Forward" button and allow the full reel of tape to wind on the empty reel. The dull side of the tape will now be facing inward on the reel.

3. Insert the free end of the tape through the hub of the right take-up reel and place a pencil firmly over the tape, forcing it into one of the three radial slots on the hub of the empty reel. Turn the reel several turns with the pencil in this position until the tape is secured to the reel and all slack is taken up between the reels.

To Record From Microphone-

1. Turn the On-Off Volume Control to the right until a click is heard and allow about thirty seconds for the unit to warm up. The pilot light located above the "Stop" button will glow when the unit is turned on.

2. Insert the microphone plug into the "Microphone Input Jack".

3. Turn the speed control knob (1) to the desired speed.

NOTE: Recordings made at a certain speed must be played back at that speed.

4. Move record lock lever (18) downward with the left hand. This releases the record safety lock which prevents accidental erasure.

5. Depress the "Record" button with the right hand (while holding the record lock lever (18) with the left hand) until it latches.

6. While talking into the microphone, adjust the "Volume" control until the "Normal" indicator flashes and no flashing occurs at the "Overload" indicator.

NOTE: Correct recording volume is very important. Too weak a signal, which does not cause the "Normal" indicator to flash, will result in

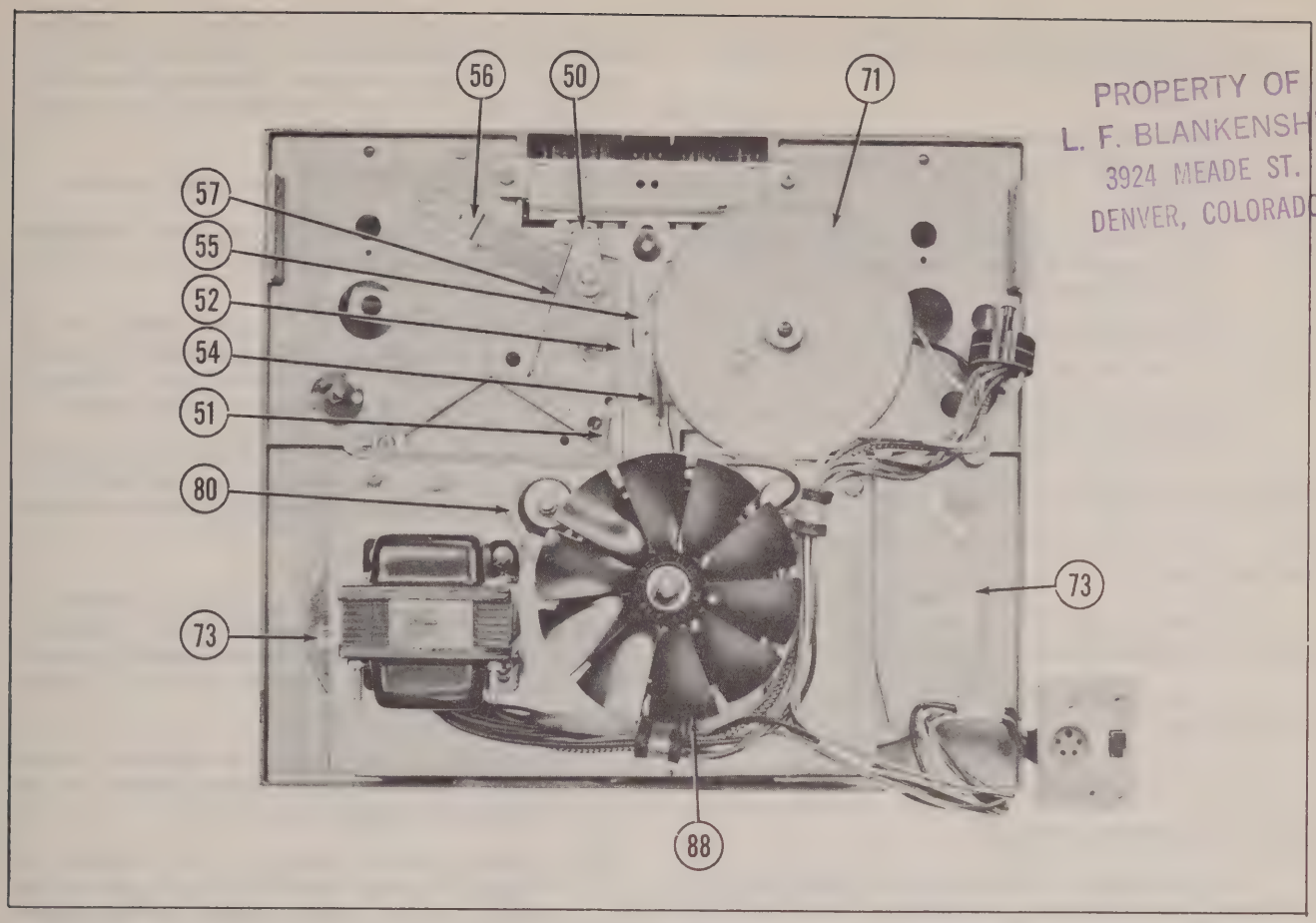

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Figure 3

weak playback and high background noise. Too strong a signal, causing the "Overload" indicator to flash, will result in distortion during playback.

To Record From External Radio-

Recordings can be made from a radio by placing the microphone near the loudspeaker of the radio; however, this type of recording may not be satisfactory as other sounds may be picked up by the microphone which as a result will be recorded on the tape. A superior quality recording can be made by use of radio-phono attachment cord (Part No. C-30.233). Connect attachment cord as follows:

1. Connect the cord clips across the voice coil terminals on the radio speaker.

2. Insert the cord plug into the "Radio- P. A. - Phono Jack".

3. Proceed as described in "To Record From Microphone".

NOTE: Remove attachment cord after recording is completed.

To Record From Phonograph-

1. Connect the cord clips of the attachment cord to the pickup leads on the external phonograph.

2. Insert the attachment cord plug into the "Radio - P. A. - Phono" jack.

3. Proceed as described in "To Record From Microphone".

NOTE: Should a hum develope from the above connection, reverse the cord clips on the pick-up leads.

To Record From Television Receiver-

1. Connect attachment cord as described in "To Record From External Radio" and proceed with recording as described in "To Record From Microphone".

NOTE: The "Recordio" Tone Control does not operate during recording. When recording from radio or a television receiver set the radio or television tone control for maximum treble.

Dual Track Recording-

The Recordio is designed so that 1/2 the tape width is recorded at a time; thereby resulting in two track recording. This two track operation is accomplished in the following manner:

1. After a reel of tape has been recorded, i.e. all of the tape wound on to the take-up reel, depress the "Stop" push button. This stops all movement of the tape.

2. Remove the reels from the recorder, turning the full reel over and placing it on the left spindle and the empty reel on the right spindle.

3. Properly thread the tape and proceed with the recording as in "To Record From Microphone".

4. After this track has been recorded the first track of recording is ready to be played without rewinding.

(a) Place the full reel of tape on the feed reel (left) spindle and the empty reel on the take-up (right) spindle.

(b) Thread the tape making sure the dull side of the tape faces the record head.

(c) Set the controls as described under "To Play A Recording".

To Play A Recording-

1. Thread the tape as described under "Threading The Tape".

2. Turn the On-Off Volume control on and allow thirty seconds for the tubes to warm up.

3. Depress the "Play" button until it is latched into position.

4. Adjust the Volume and Tone control to suit.

To Use An External Speaker-

Any size speaker of the permanent magnet type, having a 3 ohm voice coil, may be used by connecting a speaker extension cord across the voice coil of the speaker and then inserting the extension plug (same type as microphone plug) into the External Speaker Jack located on the right side of the cabinet. This automatically cuts out the self-contained speaker.

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Fast Forward And Fast Rewind-

High-speed forward or reverse wind can be obtained by pressing the desired button. These are used primarily in locating a desired portion of a recording in a few seconds.

CAUTION: The "Stop" button should always be depressed before changing functions or speeds. Always depress the "Stop" button when the Recordio is not in use.

Erasing Recorded Material-

Erasing of recorded material takes place automatically when new material is recorded; therefore, no special step is necessary to erase recordings before new recordings are made. However, if a portion of a recording or an entire reel of tape is to be completely erased, do so as follows:

1. Properly thread the tape on the machine.

2. Turn the Volume Control knob clockwise until a click is heard. This turns the recorder on.

3. Press down on the Record button until it latches into position. The erasing of recorded material is now in process and may be stopped at any time by depressing the "Stop" button.

NOTE: Only one track of recorded material is erased at a time. To erase the second track, reverse the reels and repeat the above operation.

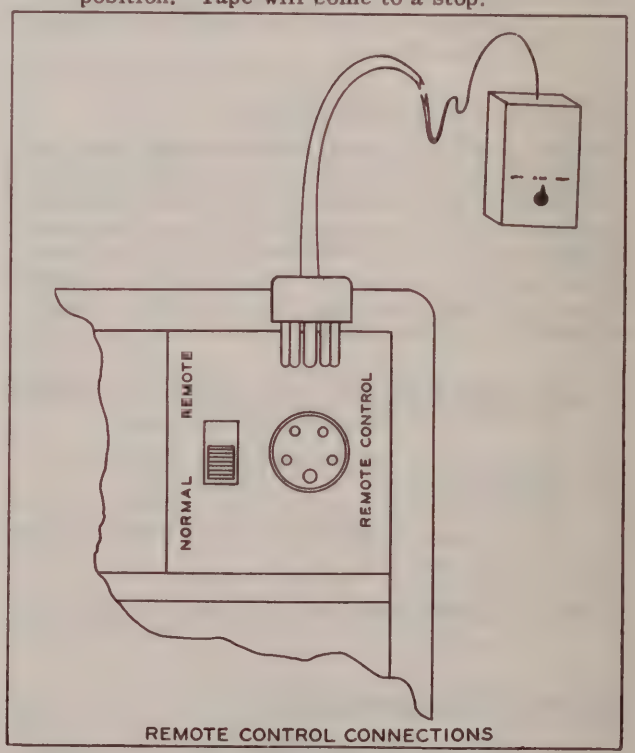
Remote Control Operation-

A socket and switch are provided to allow remote operation up to a distance of 18 feet, either recording or playback. This is accomplished by means of a remote control cable (Part No. 35.815). Connect attachment cord as follows:

1. Insert remote control cable plug into remote socket. Be sure remote control switch on end of cable is in "Standby" position.

2. With control switch on the recorder in "Normal" position start the unit in the normal manner and set volume control to the proper level.

3. Place control switch on the set to "Remote" position. Tape will come to a stop.



REMOTE CONTROL CONNECTIONS

Figure 4

The "Recordio" can now be operated (start and stop) by means of the remote cable switch. When

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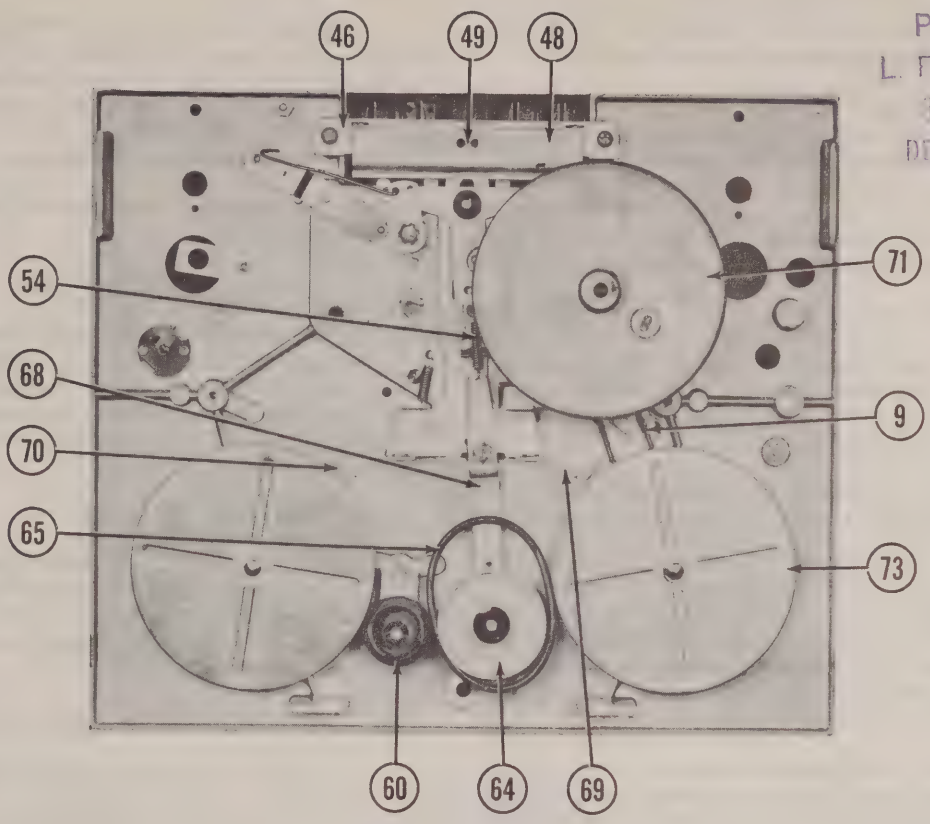

Figure 5

starting the recorder by means of the remote control, the switch should be rotated to the "Motor" position and then after a slight pause rotated to the "Record-Play" position. To stop recording or playback, rotate the control switch directly to "Standby" position, pausing slightly at the "Motor" position.

To Use Recorder As A Public Address System-

If the "Recordio" is to be used as a public address system, plug in an extension speaker or speakers, if desired. Obtain a microphone connecting cord (Part No. 9-2221-1) so that the microphone can be connected to the "Radio - P. A. -Phono" jack. Turn the recorder "On" and with the "Stop" button depressed set the "Tone" and "Volume" controls to the desired level.

ADJUSTMENTS

Disassembly Instructions-

1. Remove two Phillips head screws from rear of case.

2. Remove push-on type volume and tone control knobs.

3. Remove two screws located under volume and tone control knobs. Remove escutcheon.

4. Remove two hex head screws located under escutcheon.

5. Lift unit out of case, removing leads from speaker before removing unit completely.

Record-Play Head Adjustment (See Exploded View)-

To adjust the record-play head (28) for maximum frequency response, make the following adjustment:

1. Remove the rear cover escutcheon (5).

2. Properly thread an alignment tape or a good recorded tape on the machine.

3. Set the controls as described under "To Play A Recording".

Grip the vertical portion of the record head mounting bracket with a pair of long-nosed pliers. Rock the mounting bracket and record head from side to side slightly until the maximum high frequencies are obtained. Bend the bracket with the pliers to obtain a permanent set at this position.

4. Replace the rear cover escutcheon (5).

Pressure Pad Adjustment (See Exploded View)-

1. Remove the front and rear esctucheons (5 and 11).

2. Depress the "Play" button. Do not turn the recorder on.

3. Use a pencil type postal scale and check the amount of pressure necessary to just pull the pad away from the tape. The test should be made on the

end of the pressure pad mounting spring (37). Adjust the pressure pad for 1 3/4 oz. ± 1/4 oz. pressure.

(a) The record-head pressure pad is adjusted by the locked adjustment screw (44).

(b) The guide post pressure pad (43) is adjusted by bending the pressure pad spring. It must be adjusted for minimum pressure against the tape.

4. After the adjustments are made depress the "Stop" button and replace the trim covers.

Erase Head Adjustment-

1. With tape properly threaded, turn recorder on and depress the Record button. Allow tape to run for a few seconds then turn recorder off, but leave Record button depressed.

2. With the trim covers removed check the erase head (120), see Figure 2, to see if it is parallel with the tape.

3. Check to see if the top edge of the tape coincides with the top end of the diagonal slot in the erase head (junction of long diagonal slot and short vertical slot). To adjust level of tape, loosen lock nut (20), see Figure 6, and rotate tape guide post (21) to move tape up or down. Tighten lock nut (20).

4. After this adjustment has been made, check to see if the tape moves forward approximately 1/64" when the "Record" button is depressed, if not, loosen the forward adjustment screw (23) and turn the screw in or out as required to obtain this 1/64" adjustment. Tighten the lock nut.

5. Replace the trim covers.

Brake Shoe Adjustment (See Figure 5)-

1. In order to adjust the brake shoes, the complete mechanism must be removed from the carrying case and the speaker disconnected.

2. With all push buttons in the up position the brake shoes (70) should clear the drums by approximately 1/8".

3. Depress the "Stop" pushbutton while observing the brake shoes. Both brake shoes must contact the drums at the same time and with equal pressure.

4. The adjustment is accomplished by bending the spring arm (69).

Adjustment For Slow Take-Up Reel-

There are some instances where the spring drive belt (9), see Figure 5, stretches after a period of time. In this case, the belt should be removed and shortened.

1. Clip off 3 to 5 turns of the spring belt.

NOTE: The spring belt is made so that one end will twist into the tip of the other end; therefore, clip the turns off the large end of the belt.

2. Twist the ends together and replace the belt.

Bias Adjustment-

Turn the recorder on and depress the "Record" button; use no tape. To determine if the bias is within satisfactory limits without dismantling the unit, merely connect a VTVM from the top lug of the recording head to the chassis. If 75 to 100 volts are present, no adjustment is necessary.

If the readings are outside of this range, proceed as follows:

1. Try a new 5879.

2. If still not within range, remove the chassis shield and connect a low capacity VTVM from Pin 1 of the 6AQ5 to the chassis and adjust trimmer M4 (see Figure 8) to obtain a reading of 2.25 volts. This provides the optimum in performance.

Neon Record Level Indicators-

The neon record indicator firing level adjustment is only required if a neon bulb is replaced. The two neon record level indicators are adjusted for correct firing level by means of two trimmer capacitors, one for each indicator.

To adjust indicators proceed as follows:

1. Turn "Recordio" on and depress "Record" button.

2. Connect a short jumper lead across the bias oscillator coil (L1), (short out the coil to disable the oscillator).

3. Connect an audio oscillator, set at 1000 cycles, into the microphone input jack. Output of audio oscillator should be approximately .01 volts. (A 1 volt output may be used with a 100 to 1 reduction pad of resistors inserted between the audio oscillator and the microphone jack.)

4. Connect probe of low capacity type AC VTVM to junction of 2 - 330KΩ resistors, R22 and R23, (mounted on terminal strip near volume control).

5. Adjust volume control to obtain a reading of 36 volts on VTVM and leave control set and VTVM connected.

6. Disconnect shorting jumper from across bias oscillator coil.

7. Adjust "Normal" indicator trimmer (M5A) fully clockwise and then turn slowly counterclockwise so that upon loosening the trimmer the "Normal" neon bulb barely lights. This adjustment must be made loosening the trimmer.

8. Short out bias oscillator coil.

9. Increase volume control to obtain a reading of 88 volts on the VTVM.

10. Remove short from bias oscillator coil.

11. Adjust "Overload" indicator trimmer (M5B) as described in step "7", for just barely lighting the "Overload" indicator bulb.

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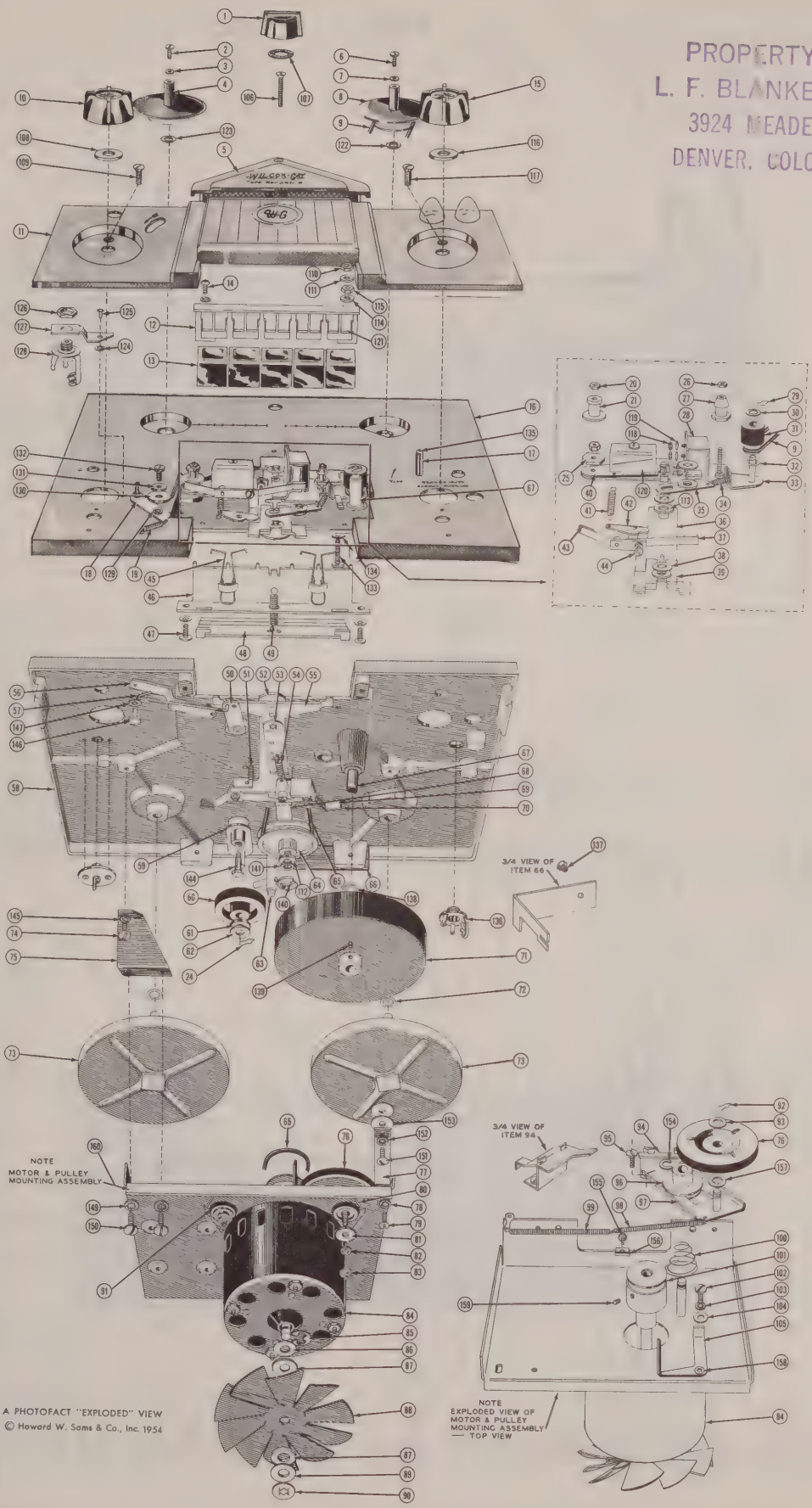
3/4 VIEW OF ITEM 66
3/4 VIEW OF ITEM 94
NOTE
MOTOR & PULLEY MOUNTING ASSEMBLY
NOTE
EXPLODED VIEW OF MOTOR & PULLEY MOUNTING ASSEMBLY — TOP VIEW
A PHOTOFACT "EXPLODED" VIEW
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Figure 6

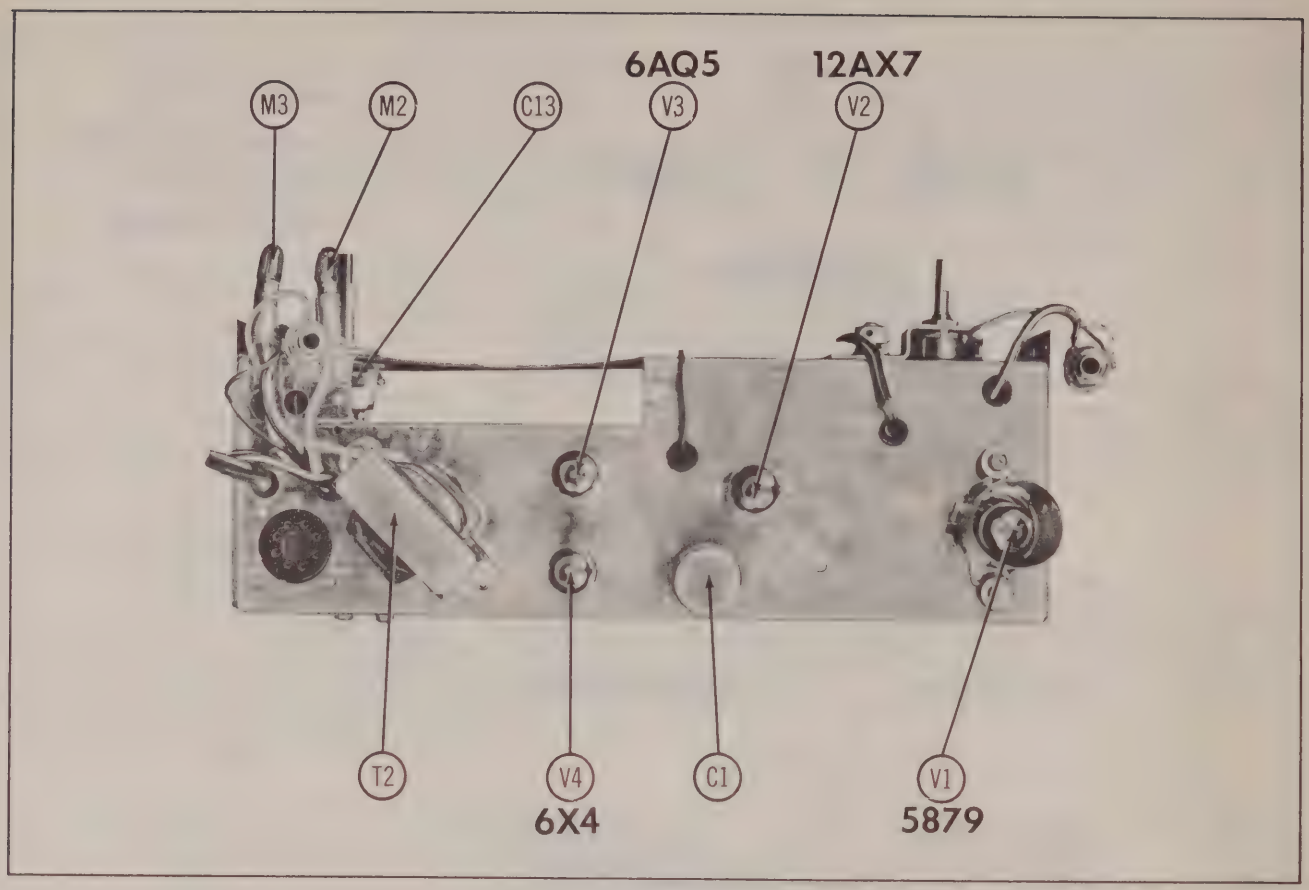


Figure 7

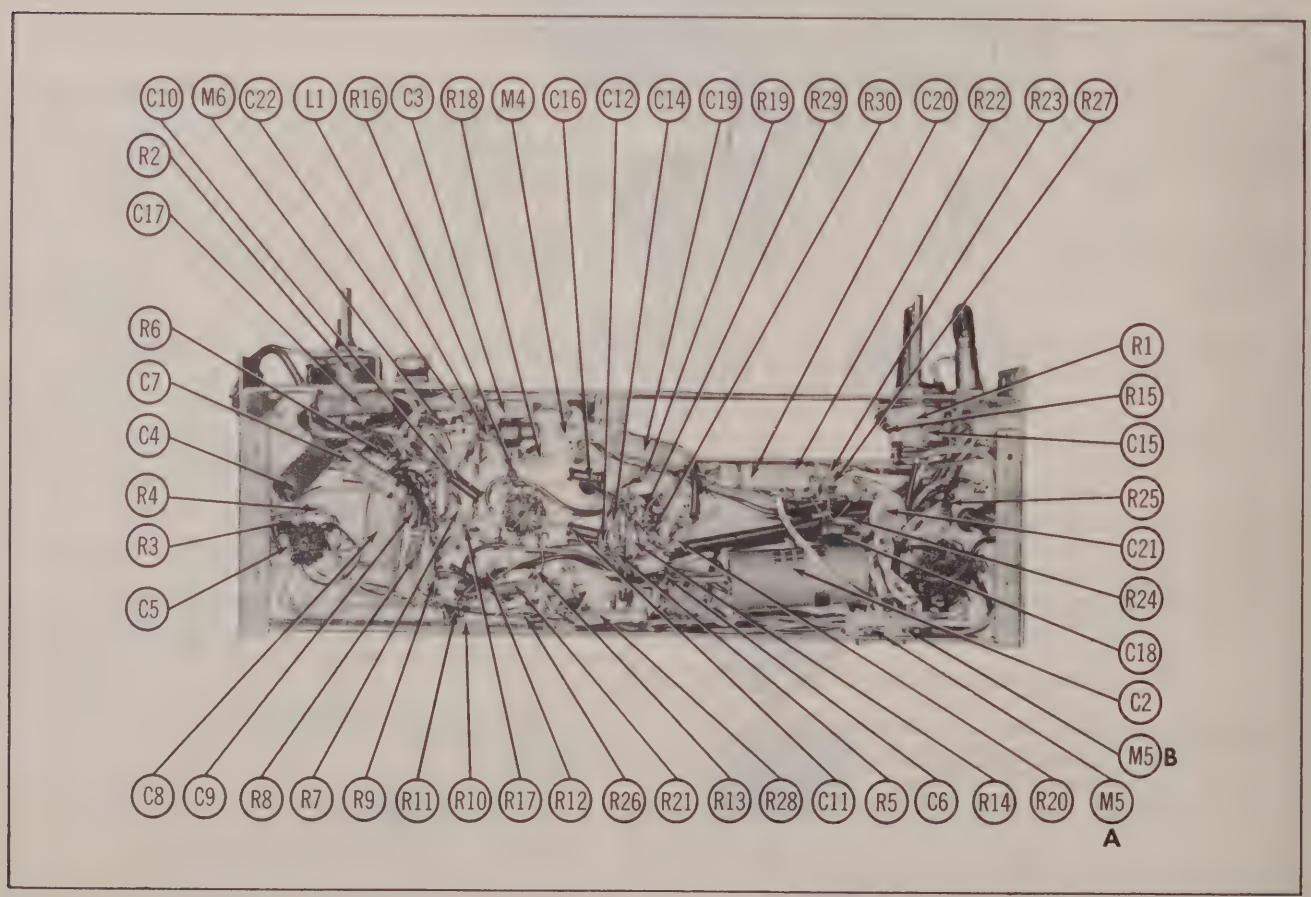
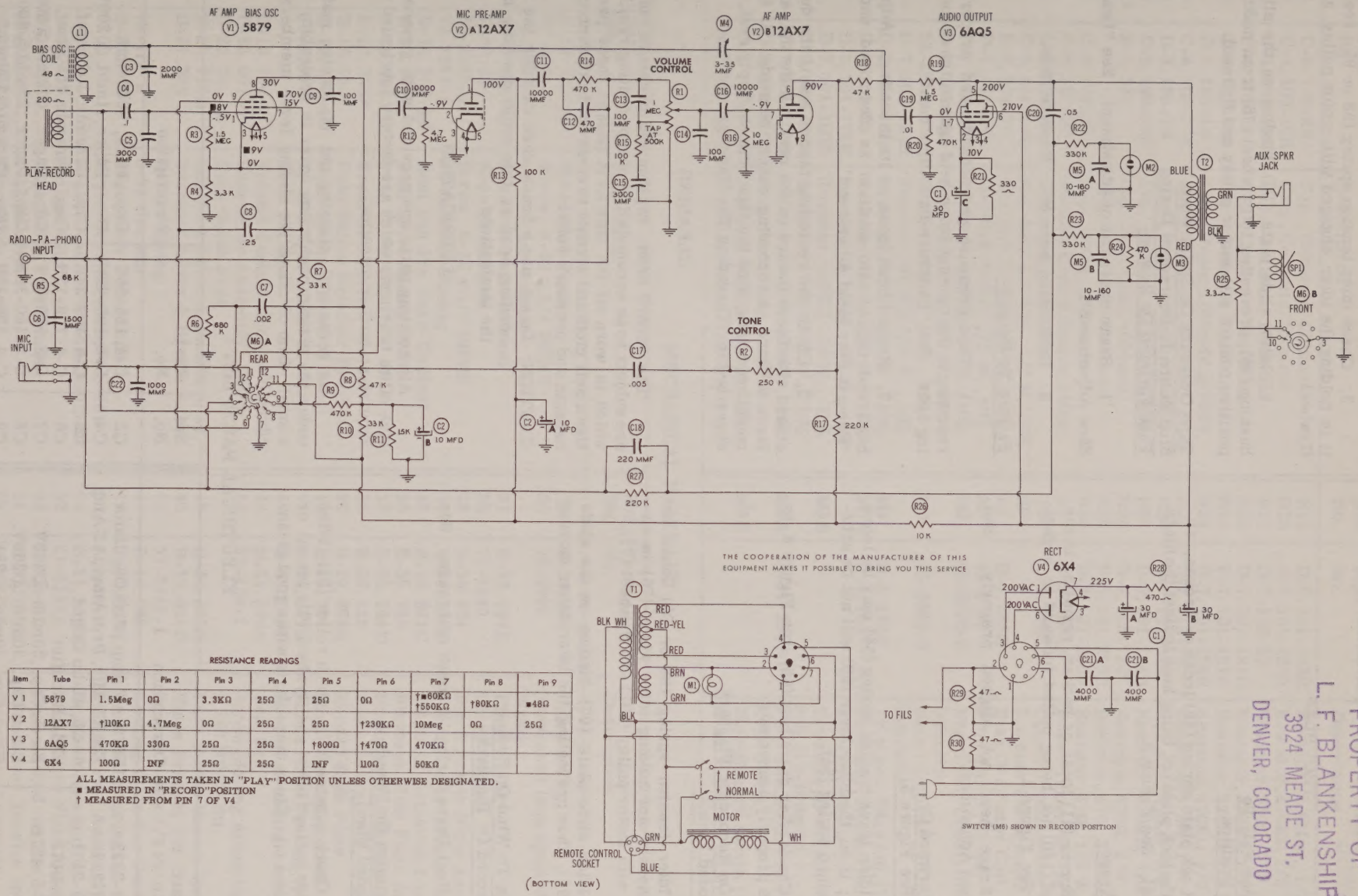


Figure 8



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	5879	1.5Meg	0Ω	3.3KΩ	25Ω	25Ω	0Ω	†■60KΩ †550KΩ	†80KΩ	■48Ω
V 2	12AX7	†110KΩ	4.7Meg	0Ω	25Ω	25Ω	†230KΩ	10Meg	0Ω	25Ω
V 3	6AQ5	470KΩ	330Ω	25Ω	25Ω	†600Ω	†470Ω	470KΩ		
V 4	6X4	100Ω	INF	25Ω	25Ω	INF	110Ω	50KΩ		

ALL MEASUREMENTS TAKEN IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
■ MEASURED IN "RECORD" POSITION
† MEASURED FROM PIN 7 OF V4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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WILCOX-GAY
MODEL 4A10

IMPORTANT: Do not readjust the recording bias oscillator adjustment after setting the indicator light adjustments.

TROUBLES

Push Buttons Fail To Latch Into Position-

1. Lock plate spring (49) loose or broken, resulting in the lock plate not being held against the hinge bracket (46). See Figure 5.

Fails To Erase-

1. Spring (41) loose or broken, resulting in the erase head (120) not being pulled forward to engage the tape. See Figure 2.

2. Erase head not aligned properly. See "Erase Head Adjustment".

No Fast Forward Or Reverse (See Figure 5)-

1. Idler lever tension spring (54) may be loose or broken; if so, the idler lever (68) will not be actuated. Replace spring (54).

2. Check idler drive belt (65), see Figure 6, to see if it is properly connected.

No Drive On Record Or Playback (See Exploded View)-

1. Idler tension spring (98 or 99) loose or broken, thereby not holding idler wheel (76) in engagement with motor pulley (101) and flywheel (71).

2. Idler slide plate (97) binding on the slide bushing (96), thus preventing the idler from moving forward.

Tape Fails To Wind On Reel During Record Or Playback-

1. Reel Drive Spring (9) loose or broken. See Figure 5.

Speed Variation Or "Wow" (See Exploded View)-

1. Check capstan (67), pinch roller (31), idler (76), motor pulley (101), and flywheel (71) for oil or foreign material. Clean these parts with a good cleaning fluid.

2. Check motor pulley (101) to see if it is secured to motor.

3. Check idler tension spring (98 or 99); see if it is holding the idler engaged with motor pulley and flywheel.

4. Idler slide plate (97) binding on the slide bushing (96), preventing idler wheel (76) from making positive contact with motor pulley and flyhweel.

Tape Overruns Or Spills When Stop Button Is Depressed During Fast Forward Or Rewind-

1. Brake shoes out of adjustment. See "Brake Shoe Adjustment".

2. Brake pads worn out. Replace pads.

Failure To Record-

1. Tape pressure pad not adjusted properly, resulting in the tape not being held against the recording head. See "Pressure Pad Adjustment".

2. Record head loose on its mounting. Adjust head and tighten into position as described under "Record-Play Head Adjustment".

3. Check the recording tape to see if the dull-coated side faces inward on the reel. If the dull side faces outward, a recording cannot be made. If this condition exists, wind the tape onto an empty reel, as described in "Threading The Tape".

CLEANING

The record head, capstan and pressure roller are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts, Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller.

CAUTION: Do not use a brush when cleaning the recording head as this could possibly mar the laminations.

LUBRICATION

All rotating parts are provided with generous-size oilite bearings, which are factory lubricated and require no further attention.

An occasional cleaning out of foreign matter under the plastic pushbutton cover is desirable, and a small drop of oil on the sliding lever members is advisable.

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1	69-2222	5879, AF Amp., Bias Oscillator	C3	D-4.105-56C	Cap., Mica, 2000mmf.
V2	69-2175	12AX7, Mic. Pre-Amp., AF Amp	C4	D-3.100-22N	Cap., Paper, .1mfd. @ 200V.
V3	69-2171	6AQ5, Audio Output	C5	C-4.109-31R	Cap., Ceramic, 3000mmf.
V4	69-2172	6X4, Rectifier	C6	C-4.109-13R	Cap., Ceramic, 1500mmf.
C1A	B-5.437B	Elect. Cap., 30mfd. @ 250V.	C7	D-3.100-2	Cap., Paper, .002mfd. @ 600V.
C1B		Elect. Cap., 30mfd. @ 250V.	C8	D-3.100-30N	Cap., Paper, .25mfd. @ 200V.
C1C		Elect. Cap., 30mfd. @ 25V.	C9	C-4.109-10R	Cap., Ceramic, 100mmf.
C2A	B-5.444	Elect. Cap., 10mfd. @ 200V.	C10	C-4.109-33R	Cap., Ceramic, 10,000mmf.
C2B		Elect. Cap., 10mfd. @ 200V.	C11	C-4.109-33R	Cap., Ceramic, 10,000mmf.

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ELECTRICAL PARTS LIST - Con't.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C12	C-4.109-2R	Cap., Ceramic, 470mmf.	R19	D-7.101-148R	Resistor, 1.5Meg., 1/2 W., 10%
C13	C-4.109-10R	Cap., Ceramic, 100mmf.	R20	D-7.101-128R	Resistor, 470KΩ, 1/2 W., 10%
C14	C-4.109-10R	Cap., Ceramic, 100mmf.	R21	D-7.102-2P	Resistor, 330Ω, 1 W., 10%
C15	C-4.109-31	Cap., Ceramic, 3000mmf.	R22	D-7.101-121R	Resistor, 330KΩ, 1/2 W., 10%
C16	C-4.109-33R	Cap., Ceramic, 10,000mmf.	R23	D-7.101-121R	Resistor, 330KΩ, 1/2 W., 10%
C17	D-3.100-4N	Cap., Paper, .005mfd.@600V.	R24	D-7.101-128R	Resistor, 470KΩ, 1/2 W., 10%
C18	C-4.109-27R	Cap., Ceramic, 220mmf., ±10%	R25	C-6.212-1B	Resistor, 3.3Ω, 1 W.
C19	D-3.100-7N	Cap., Paper, .01mfd. @400V.	R26	D-7.101-58R	Resistor, 10KΩ, 1/2 W., 10%
C20	D-3.100-19N	Cap., Paper, .05mfd. @400V.	R27	D-7.101-114R	Resistor, 220KΩ, 1/2 W., 10%
C21A	B-4.131	Cap. Disc. Dual, 4000mmf.	R28	D-7.103-72C	Resistor, 470Ω, 2 W., 10%
C21B		Cap. Disc. Dual, 4000mmf.	R29	D-7.101-250R	Resistor, 47Ω, 1/2 W., 10%
C22	C-4.109-9R	Cap., Mica, 1000mmf.	R30	D-7.101-250R	Resistor, 47Ω, 1/2 W., 10%
R1	C-8.227-2G	Volume Cont. & Switch, 1Meg.	T1	C-35.804A	Power Trans. & Plug Assy.
R2	C-8.231-1A	Tone Cont., 250KΩ	T2	C-9.264E	Output Transformer
R3	D-7.101-148	Resistor, 1.5Meg., 1/2 W., 10%	SP1		3.2 ohm PM Speaker
R4	D-7.101-37	Resistor, 3.3KΩ, 1/2 W., 10%	L1	B-1.556E	Bias Oscillator Coil
R5	D-7.101-93R	Resistor, 68KΩ, 1/2 W., 10%	M1	45-2003	Pilot Lamp (TS-44)
R6	D-7.101-134R	Resistor, 680KΩ, 1/2 W., 10%	M2	45-2036-0	Neon Lamp (NE51) Normal Indicator
R7	D-7.101-79R	Resistor, 33KΩ, 1/2 W., 10%			
R8	53-2834	Resistor, 47KΩ, 1 W., 10%	M3	45-2036-0	Neon Lamp (NE51) Overload Indicator
R9	D-7.101-128R	Resistor, 470KΩ, 1/2 W., 10%			
R10	D-7.101-79R	Resistor, 33KΩ, 1/2 W., 10%	M4	B-4.132B	Trimmer, Bias Adj. (3-35mmf.)
R11	D-7.101-65	Resistor, 15KΩ, 1/2 W., 10%	M5A	B-4.140	Trimmer, Normal Indicator Adj. (10-160mmf.)
R12	D-7.101-178R	Resistor, 4.7Meg., 1/2 W., 10%			
R13	D-7.101-100R	Resistor, 100KΩ, 1/2 W., 10%	M5B		Trimmer, Overload Indicator Adj. (10-160mmf.)
R14	D-7.101-128R	Resistor, 470KΩ, 1/2 W., 10%			
R15	D-7.101-100R	Resistor, 100KΩ, 1/2 W., 10%	M6A	B-11.230F	Play-Record Switch (Viewed from Rear)
R16	D-7.101-192R	Resistor, 10Meg., 1/2 W.			
R17	D-7.101-114R	Resistor, 220KΩ, 1/2 W., 10%	M6B		Play-Record Switch (Viewed from Front)
R18	D-7.101-86R	Resistor, 47KΩ, 1/2 W., 10%			

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	C-13.253-2C	Speed Shift Knob	29	B-33.409	Hairpin Clip
2	57-2049-4	Screw, 6-32 x 1/4 BHMS	30	73-2340	Varnished Impregnated Linen Washer
3	72-2334-1	#6 Cantlink Washer			
4	B-13.261-4F	Reel Pan For Feedreel	31	B-33.404E	Pinch Roller
5	D-13.264	Rear Escutcheon	32	73-2340	Linen Washer
6	57-2049-4	Screw, 6-32 x 1/4 BHMS	33	B-35.824	Pinch Roller Plate Assembly
7	72-2334-1	#6 Cantlink Washer	34	B-31.336D	Pinch Roller Tension Spring
8	D-13.262-4G	Reel Pan For Take-Up Reel	35	B-19.881C	Playback Actuating Lever
9	B-31.351A	Reel Drive Spring (Belt)	36	B-35.758	Playback Slide Plate Assembly
10	C-13.254-5D	Tone Control Knob	37	B-35.764D	Pressure Pad Spring Assembly
11	E-13.295A	Front Escutcheon, Green	38	B-33.412	Push-On Stud Nut, 3/16 Stud.
12	B-19.858	Push Button Retainer Bracket	39	B-19.868A	Record Slide Plate
13	B-13.258-4D	Push Button, Green (5 Used)	40	B-35.794	Erase Head Plate Assembly
14	57-2109-2	#6-32 x 3/16 BHMS St. Stat. Brz. Phillips	41	B-31.347B	Erase Head Tension Spring
			42	B-35.766C	Record Actuating Lever Assy.
15	C-13.254-6D	Volume Control Knob	43	B-31.334A	Felt Pad
16	D-35.807-1	Base Plate Assembly, Green	44	57-428-1	Screw (Spring Adjusting) #6-32 x 3/8 RHMS Stl.
17	B-32.282-A	Tape Guide Post			
18	B-35.775B	Interlock Lever & Handle Assy.	45	B-31.337A	Push Button Return Spring
19	B-31.338	Interlock Lever & Handle Assy. Return Spring	46	B-19.859D	Hinge Bracket For Push Buttons
			47	57-3445-1	Screw, 8-32 x 3/8 Phillips Rd.Hd.
20	48-410-1	6-32 Hex Nut	48	B-19.870	Locking Plate For Push Buttons
21	B-32.300	Tape Guide Post (Left)	49	B-31.343A	Lock Plate Spring
22		Erase Head Adjustment Screw	50	110-48-B	Switch Lever Assembly
23		Erase Head Forward Adjustment	51	B-31.338B	Brake Return Spring
24	B-33.409	Hairpin Clip	52	51-3233A	Brake Slide Plate Assembly
25	B-32.260D	Tape Guide Post Spacer	53	B-33-412	Push-on Stud Nut For 3/16" Stud.
26	48-410-1	6-32 Hex Nut	54	B-31.339B	Idler Lever Tension Spring
27	B-32.252F	Tape Guide (Right)	55	B-35.759	Shift Plate Assembly
28	C-36.156B	Recording Head, Tape, (Shure Bros. TR16A Low Impedance)	56	B-35.774	Record Interlock Assembly
			57	B-31.333A	Switch Arm Length

Ref. No.	Part No.	Description
58		(Bottom View Of Item 16)
59	B-35.757C	Sub-Idler Plate Assembly
60	B-33.405D	Sub-Idler Wheel
61	73-2254-6	Felt Washer
62	73-2241-150	Flat Washer, 7/16"
63	C-35.816	Speed Control Shaft Assembly
64	B-33.406	Idler Drive Sheave
65	B-28-162	Idler Drive Belt
66	B-19.840E	Idler Steady Bracket. (Part Of Item 160)
67	B-32.259F	Capstan Shaft
68	B-35.801C	Idler Lever Assembly
69	97-3062	Brake Spring
70	B-31.335A	Brake Pad, Felt
71	C-13.257B	Flywheel
72	B-28.163	Linen Washer
73	C-19.968	Brake Drum
74	57-2102-3	Screw, 8-32 x 1/4 RHMS
75	B-19.863	Drive Mtg. Plate Bracket
76	B-33.408B	Rubber Bonded Idler, 2 1/2" Dia.
77	B-19.862C	Angle Bracket For Mounting Drive Assembly
78	73-2231-5	#8 Int. Lockwasher, Stl. C. P.
79	57-2102-3	Screw, 8-32 x 1/4 RHMS, Phillips
80	C-19.837E	Motor Adaptor Plate
81	B-33.411A	Washer (Flat), 3/4 OD x 3/16 ID x .050 Stl. C. P.
82	73-2231-5	Lockwasher, Internal #8
83	48-409-1	Hex Nut, #8-32 x 5/16" Stl. C. P.
84	D-36.153	Motor, Round Type Fasco
85	B-33.418	Truarc Retaining "E" Ring
86	73-2241-143	Washer, (Flat) 5/8 OD x .260 ID x .032 Stl. C. P.
87	73-2254-3	Washer, Felt, 3/4 OD x 1/4 ID
88	C-19.887-A	Fan Blade
89	73-2241-143	Washer, (Flat) 5/8 OD x .260 ID x .032 Stl. C. P.
90	33.415	Push-on Fastener (Presthole)
91	B-28.159	Shockmount, Lord, J-2927-1-2
92	B-33.409	Hair Pin Clip
93	B-28.163	Linen Washer
94	B-19.878B	Speed Shift Lever
95	57-2109-2	Screw, 6-32 x 3/16 BHMS Stl. Stat. Brz. Phillips
96	B-32.264E	Idler Slide Bushing
97	B-35.768	Idler Slide Plate Assembly
98	B-31.324A	Idler Spring (Tension)
99	B-31.324A	Idler Spring (Tension)
100	B-31.327C	Idler Lift Compression Spring
101	B-32.288B	Motor Pulley
102	57-2102-3	Screw, 8-32 x 1/4 RHMS Stl. C. P.
103	73-2231-5	Internal Lockwasher, #8 Stl. C. P.
104	73-2241-143	Flat Washer 5/8 OD x .260 ID x 1/32 Stl. C. P.
105	110-47	Idler Throw-out Lever
106	57-3494-0	Screw, 6-32 x 1 OHMS Brass
107	73-2254-3	Washer, Felt, 3/4 OD x 1/4 ID
108	73-2254-3	Washer, Felt, 3/4 OD x 1/4 ID
109	57-2106-1	Screw, 8-32 x 1 OHMS Phillips,
110	48-410-1	Nut, Steel, 6-32 C. P. 1/4 AF
111	73-2234-3	Int. Lockwasher, #6 Stl. C. P.
112	73-2254-6	Felt Washer
113	73-2241-148F	Flat Washer 1/2 OD x .205 ID x 1/32 Stl. C. P.
114	73-2234-3	Int. Lockwasher, #6 Stl. C. P.
115	48-410-1	Nut, Steel, 6-32 C. P. 1/4 AF
116	73-2254	Washer, Felt, 3/4 OD x 1/4 ID
117	57-2106-1	Screw, 8-32 x 1 OHMS Phillips, Stl. Stat. Brz.
118	48-2216-1	Hex. Nut, 2-56 x 3/16 Brass C.P.
119	73-2233-1	Int. Lockwasher, #3 Phos. Brz. N. P.
120	C-35-756A	Permanent Magnet Type Erase Head Assembly
121	B-35.755B	Push Button Assembly
122	B-28.163	Linen Washer
123	B-28.163	Linen Washer
124	73-2231-5	Int. Lockwasher, #8 Stl. C. P.
125	54-2030-35	Drill Rivet, 1/4 x .122 x 7/32 Oval Brass N. P.
126	48-2213-1	Hex Nut, 8-32 x 11/32
127	B-19.883	Bracket (Input Jack)
128	B-33.400	Midget Jack
129	B-32.291	Shoulder Washer
130	73-2241.118	Flat Washer, 7/16 x 1/8 x .050 Stl. C. P.
131	73-2231-5	Int. Lockwasher Stl. C. P.
132	57-2474-1	Screw, 8-32 x 5/16 RHMS Stl. C. P.
133	57-3603-1	Screw, 6-32 x 1/2 BHMS
134	73-2231-4	Int. Lockwasher Stl. C. P.
135	57-3496-1	Screw, #6-32 x 1 RHMS Phillips Stl. N. P.
136	B-33.400	Midget Jack
137		4-40 x 1/4 Hex. Nut
138	B-23.163	Linen Washer
139		8-32 x 3/16 Allen Hd. Set Screw
140		Truarc Retaining "E" Ring
141	73-2241-150	Washer, Flat, Blued Steel 7/16"
144		Hex. Hd. Shoulder Screw
145	73-2231-5	Int. Lockwasher, #8, Stl. C. P.
146	54-2030-35	Drilled Rivet, 1/4 x .122 x 7/32, Oval Brass N. P.
147	73-2241-118	Flat Washer, 7/16 x 1/8 x .050 Stl. C. P.
149	73-2231-5	Int. Lockwasher, Stl. C. P.
150	57-2102-3	Screw, 8-32 x 1/4 RHMS Stl. C.P.
151	57-2102-3	Screw, 8-32 x 1/4 RHMS Stl. C.P.
152	73-2231-5	Int. Lockwasher, Stl. C. P.
153		1/2 x 3/16 x 3/64 Flat Washer
154	B-33.407-1	"C" Washer, Stl. C. P.
155		#4 x 3/16 P. K. Screw Hex. Hd.
156	B-19.961	Spring Clip
157	B-28-163	Linen Washer
158	B-32.291	Shouldered Washer, Stl., C. P.
159	57-3589-1	#8-32 x 1/4 Bristol Hd. Cup Point Set Screw Stl., C. P.
160	D-35.753-1B	Drive Mounting Plate Assembly